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Equip Machines for Large Work

Special Work Supports on Boring Mill and Pits for
Other Tools Are Features of Hubbard
Machine Shop

BY ROGERS A. FISKE*

FIFTEEN years ago the Hubbard Steel Foundry Co., East Chicago, Ind., was formed through the purchase and renaming of the old Davidson Iron Foundry. At that time the plant consisted of a single department with an annual capacity of 3600 tons of rough steel castings. By 1925 the capacity had been increased 14 times, that is, to 50,000 tons a year. The most recent addition to the works, a machine shop built last year, has been equipped with tools large enough to handle the heaviest class of work required in the steel mills of the Chicago district.

There are two foundry buildings, designated No. 1 and No. 2. The former is the older and is equipped with two 35-ton open-hearth furnaces and a roll turning shop. To the south is the No. 2 foundry, equipped with a 10-ton open-hearth furnace. The new machine shop is located between the two foundries, as are the pattern shop and the pattern storage buildings. The cast-

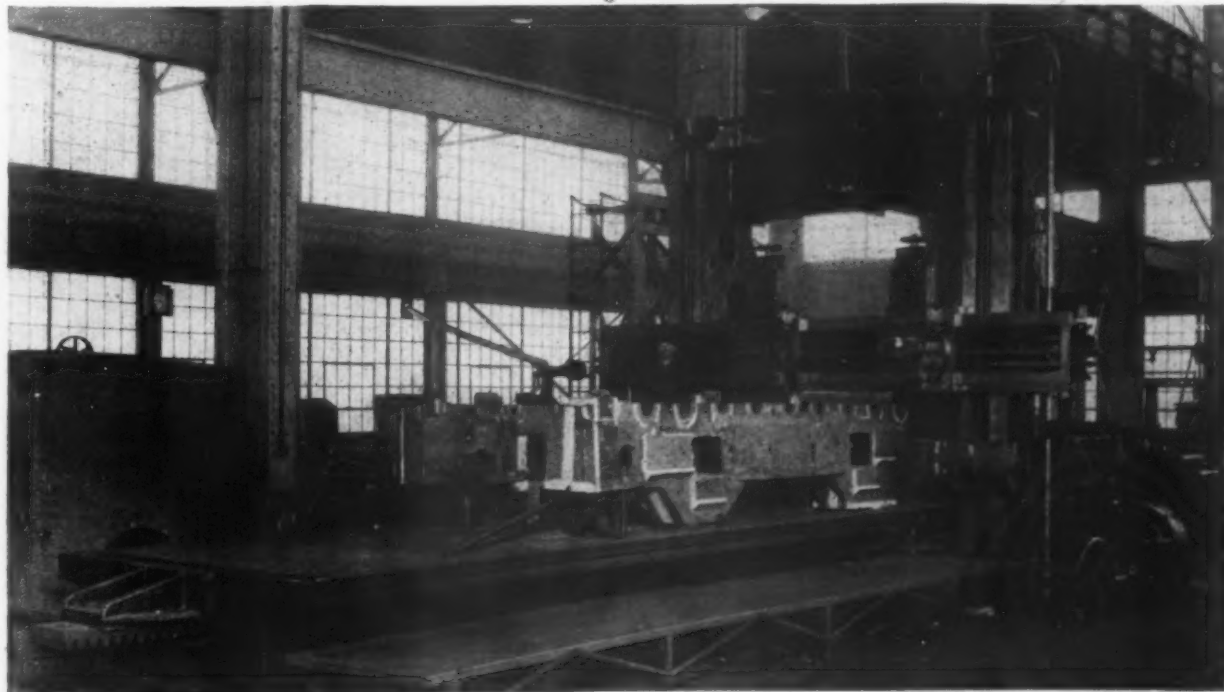
ings made are principally iron, steel and alloy steel rolls, steel parts for rock crushing machinery, large steel gears, and steel locomotive and car parts.

Shop Does Both Jobbing and Production Work

In the new machine shop all castings, with the exception of rolls, are finished. In addition, many users of heavy castings, whose machine tool equipment is inadequate, deliver them to the Hubbard plant for machining. This jobbing business supplements the regular production work which comes to the shop from the company's own foundries.

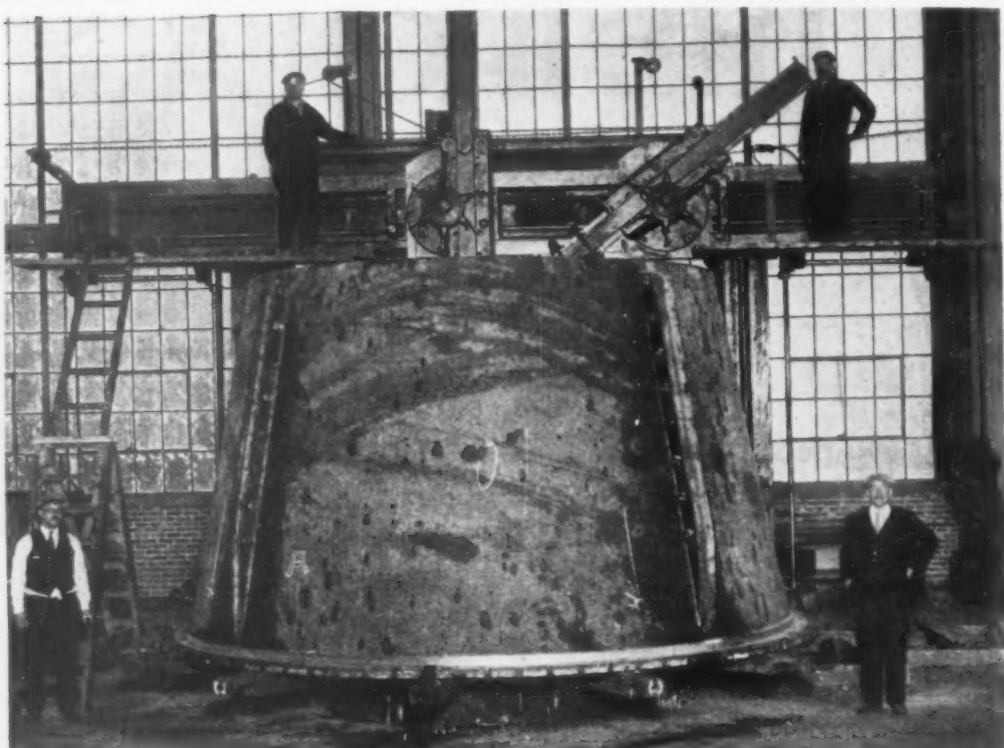
The larger machine tools are located in the main bay of the shop. They consist of a 96-in. 400-ton motor-driven Niles wheel press; a 72-in. traveling-head planer, made by the Morton Mfg. Co., Muskegon Heights, Mich.; a 10 x 10 x 30-ft. Niles planer; a 14-ft.-23-ft. and a 10-ft. vertical boring mill, both made by the Betts Machine Works, Rochester, N. Y.; a 52-in. Niles vertical boring

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A 10 x 10 x 30-Ft. Planer Is Part of the Shop Equipment. The pieces being machined are girders for a blooming mill table

To Handle Castings Too Large to Fit on the Table of the Boring Mill Tee-Slotted Work Supports Have Been Extended Radially from the Front of the Machine. The cutting tool is mounted on the boring mill table. The work shown is a blast furnace hopper. The photograph was taken before the laying of the floor, which is flush with the top of the work supports



machine; a 7-ft. American universal radial drill; and a 6-ft. Cincinnati-Bickford radial drill.

Pits Provided for Machining Large Work

Several interesting methods are employed with four of the larger machines to make them adaptable for work on unusually large castings. The Morton traveling-head planer stands on a cast iron bed at one end of which is a pit, covered with removable floor plates. Castings too large to be machined when fastened to the bed are lowered into the pit, and the planer is moved forward on its bed until within reach of the work. Pits have also been provided near the 7-ft. and

the 6-ft. radial drills. A 20x20-ft. surface plate is now being erected at the east end of the bay.

Special Work Supports Expand Capacity of Mill

Occasionally a casting which is too large to fit on the table of the 14-ft.-23-ft. Betts boring mill will require machining on an arc of less than 180 deg. To provide for work of this kind six tee-slotted rails have been imbedded in the concrete floor, flush with the top of a wood block surface. These are at the front side of the machine and are spaced about 30 deg. apart. The casting is fastened to the tee-slot rails and the cutting tool is mounted on the boring mill table. Since the mill is equipped with a reversing mechanism, the tool



Ample Floor Space for Storage Has Been Provided Around All Machines. Continuous sash and abundant electric lights insure excellent illumination



The Traveling Head Planer Can Be Moved Forward on its Bed to Work on Large Castings which Are Lowered Into a Pit. The pit cover is barely discernible in the extreme left foreground

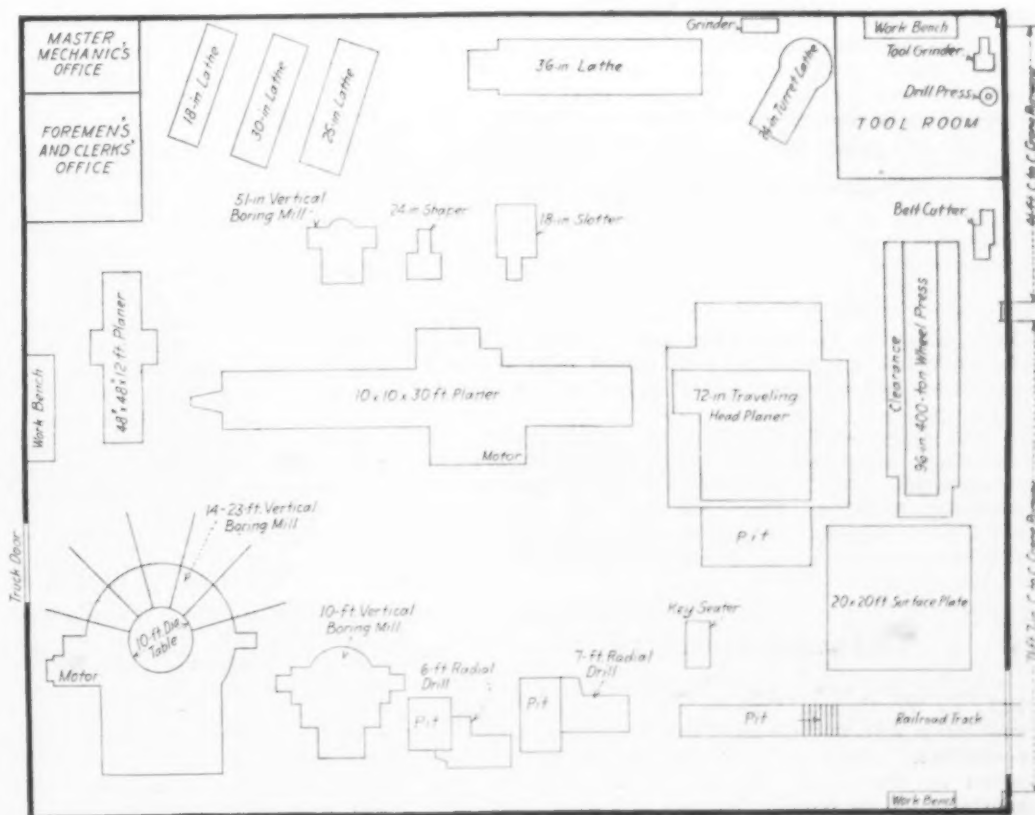
can cut on an arc of approximately 180 deg. and on radii greater than that of the clearance between the center of the table and the machine housings. The tool is mounted in a special fixture arranged for hand feeding, so that the operator can quickly adjust the tool for the next cut at each reversal of the table.

Among the lighter tools and those which are located in a lean-to are a Brown & Sharpe universal grinder, a No. 4 Kearney & Trecker milling machine,

a No. 6 Mitts & Merrill keyseater, a 2½-in. Acme bolt cutter, a 24-in. Gisholt turret lathe, an 18-in. Dill slotter, a 48-in.x12-ft. Gray planer, and several lathes ranging in size from 18-in.x12-ft. to 36-in.x34-ft.

The machine shop building consists of a main bay, 75 ft. wide, and a lean-to, 40 ft. in width. The framework is of structural steel, erected by the Worden-Allen Co., Milwaukee. To take full advantage of daylight, continuous steel sash was used liberally in inclos-

The Main Bay is 75 Ft. Wide and the Leanto Is 40 Ft. in Width. All heavy equipment, with the exception of a large lathe, is located in the main bay



ing the building. The roof is of monitor type, sheathed with wood and covered with a composition material.

Material Handling Facilities Comprehensive

Castings are delivered to the building either on railroad cars or motor trucks. A track extends into the southeast corner of the main bay, where a pit, covered with perforated cast steel plates, is provided for the maintenance of locomotive cranes. At the opposite, or west, end of the bay, is a double-width door through which trucks may enter to discharge or pick up loads.

Serving the main bay is a Shaw 35-ton overhead electric traveling crane, equipped with a 5-ton auxiliary hook. In the lean-to is a 5-ton Milwaukee Electric Crane & Mfg. Corporation motor-driven crane, also equipped with an operator's cage. The runway for this crane is 20 ft. above the floor. Stairways replace conventional ladders to the crane runways.

The tool room is a screened-off portion of the lean-to floor. Here also are located the master mechanic's and shop foreman's offices, which are set off by wooden partitions and roofed over to shut out noise from the shop. The floors of both machine shop bays are laid with Kreolite wooden blocks, made by Jennison-Wright Co., Toledo, Ohio.

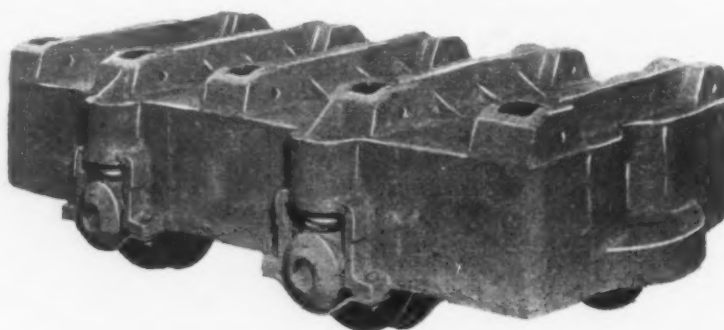
All machine tools are individually driven by 230-volt d.c. motors, furnished by the General Electric Co.,

Schenectady, N. Y.; the Westinghouse Electric & Mfg. Co., East Pittsburgh, and the Reliance Electric & Engineering Co., Cleveland. Motor controls are of the automatic, push-button type and were furnished by the Electric Controller & Mfg. Co., Cleveland. Electric current, which is purchased from the Northern Indiana Gas & Electric Co., is delivered to the plant at 11,000 volts, three phase, 60 cycles, and is stepped down to 440 volts in three single-phase transformers. Two rotary converters change it to direct current for power purposes about the plant.

All electric lights in the shop are suspended from the ceiling except two rows of angle lights, which are secured to the columns just below the crane runway in the main bay. The shop is heated by two Skinner Brothers Mfg. Co. units, which consist essentially of steam coils and motor-driven fans. A 250-hp. water-tube boiler, made by the E. Keeler Co., Williamsport, Pa., has been installed and will furnish steam at 80-lb. pressure to the heating units.

Jobs entering the shop are ticketed and then assigned by the foreman. A timekeeper, working with the accounting department, keeps a record of the machine hours and the man hours. It is planned, in the near future, to run extensive power consumption tests on each machine in the shop, the results of the tests to be used as the basis for prorating the power consumption of each machine.

This Billet Car Is Typical of the Class of Work Turned Out by the Hubbard Steel Foundry Co.



Will Install New Billet Mill at Worcester Works

The American Steel & Wire Co. will replace some of its old mill equipment at its Worcester, Mass., works with modern equipment. With a view of changing operations to conform with more modern mill practice, a billet mill will be added to take steel from the present blooming mill and roll billets down to 1½ in. square for the rod mills. At present the steel for the rod mills comes directly from the blooming mill in 4-in. sections. A new rod mill will replace one of the present mills.

An order for designing and building the two mills has been placed with the Morgan Construction Co. Both mills will be electrically driven, but the orders for the motors have not yet been placed. The new mill equipment will not provide an increase in the present capacity.

The American Steel & Wire Co. will shut down the Bessemer converter department of its new steel works in Cleveland, May 1, for about 60 days to build a new converter building. The plant has two 15-ton converters. A supply of steel has been accumulated so that the operation of the finishing department will not be interrupted.

To Install Sintering Plant

A sintering plant of the Dwight-Lloyd type will be built by the Central Furnace Co., Massillon, Ohio, in connection with its new blast furnace, which is nearing completion. Plans and specifications have been prepared by the Freyn Engineering Co., Chicago, and contracts for the building hoppers and other steel work have been placed with the Morgan Engineering Co., Alliance, Ohio.

Another Addition to the Erie Foundry Co. Machine Shop

The Erie Foundry Co., Erie, Pa., will soon start work on another extension to its main machine shop, the third in the past six months. The first, a tool room, now is in use. The second, a blacksmith shop, which will soon be occupied, in which will be installed one of each of the various types of hammers built by the company, permitting the use of the shop both as a demonstration room and for production work. The newest addition will be used principally as an assembling and testing floor for steam and board drop hammers and trimming presses. It will be of brick and steel construction with a good proportion of steel sash in the walls and a cement tile roof. It will have crane capacity for handling 75-ton, one-piece anvil blocks, and will be 35 ft. high to the crane rail to give ample head room for assembling large hammers. Two wall cranes for lighter assembling work also are called for in the plans. The addition and equipment call for an expenditure of approximately \$75,000.

To Start Algoma Rail Mill

The rail mill of the Algoma Steel Corporation, Sault Ste. Marie, Ont., will resume operations on Sunday, April 11, according to a statement made by Vice-President and General Manager J. D. Jones. No. 2 blast furnace is now operating and No. 3 blast furnace was to blow in March 29. The third open-hearth furnace was lighted some days ago, owing to an increase in miscellaneous business, making additional production of steel necessary. The increased need for steel is a direct result of orders placed by the Canadian Pacific Railway for cars and other rolling stock.

Delving Into Metal Structures

III.—New Etching Medium Brings Out in Aluminum and Its Light Alloys Hitherto Undeveloped Crystal Formations and Constituents

BY J. R. VILELLA

THE reagents most widely employed for etching aluminum and its light alloys can be divided into two classes:

- I. Those employed for differentiating between compounds.
- II. Those used for developing the microstructures, i.e. the grain boundaries and structures within the grains.

The Class I Reagents

Aqueous Solutions of Nitric Acid: These are generally used hot. The procedure known as "the nitric acid quench" is carried out as follows: The specimen

20 per cent solution (Hanson) colors copper aluminide brown, while the other compounds are not affected. These methods are apt to give variable results if not controlled closely.

Alcoholic Solutions of Nitric Acid: These solutions are said to be useful for etching aluminum-magnesium alloys. It is claimed that the compound formed by these metals (Al_2Mg_3) is colored brown by a 1 per cent solution.

Ferric Sulphate Solutions (R. J. Anderson): Solutions containing between 5 and 10 per cent ferric sulphate are used to differentiate between copper and iron aluminides, the former etching black and the latter



Fig. 28—A 15 Per Cent Zinc Alloy, Forged and Annealed at 450 Deg. C. for 5 hr. X 100

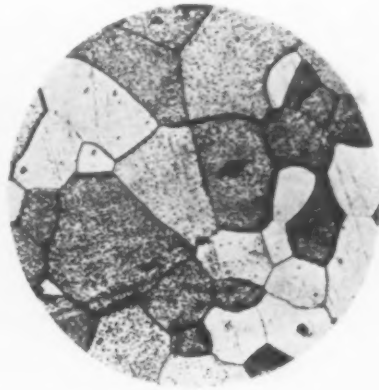


Fig. 29—A 5 Per Cent Copper Alloy, Forged and Annealed at 500 Deg. C. for 6 Hr. and Quenched. X 100. (Middle, at top)



Fig. 30—Pure Aluminum, Annealed 2 Hr. at 320 Deg. C. X 100



Fig. 31—Duraluminum, Forged and Quenched After 10 Hr. at 500 Deg. C. X 250. (At left)

is immersed for 30 sec. in a 25 per cent solution of nitric acid at a temperature of 70 deg. C., withdrawn, and plunged immediately into cold water. When carried out precisely, copper aluminide appears black, iron aluminide a purple shade and the X constituent light gray. (Dix.) An immersion of only 2 or 3 sec. in a

gray. The same results are obtained by the use of nitric acid solutions and these are generally preferred.

Solutions of Sodium Hydroxide: Dilute aqueous and alcoholic solutions can be employed for identifying copper aluminide when it occurs together with iron, manganese or nickel aluminides, but does not permit

THIS is the third and last article of a series on new etching reagents and polishing methods as applied to iron-chromium base alloys (THE IRON AGE, March 18), to certain copper alloys (THE IRON AGE, March 25) and to aluminum and its light alloys (this issue). The author is a member of the technical staff of the Union Carbide & Carbon Research Laboratories, Inc., Long Island City, N. Y.

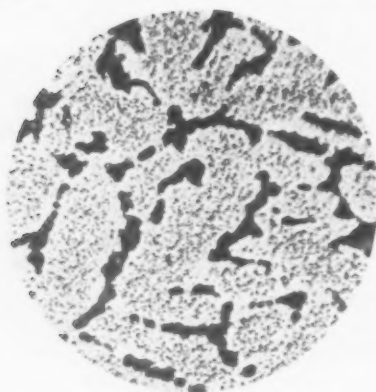


Fig. 32—Magnalite, Chill Cast and Heat Treated for 10 Hr. at 500 Deg. C., Quenched and Drawn at 270 Deg. C. for 3 Hr. X 500

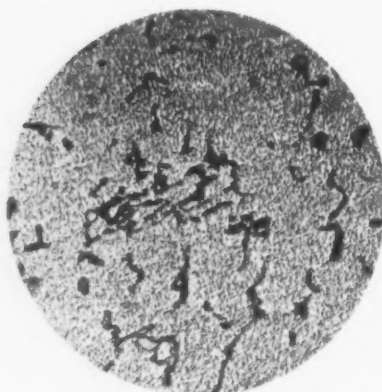


Fig. 33—Duraluminum, Forged, Quenched and Heat Treated at 220 Deg. C. for 2 Hr. X 500

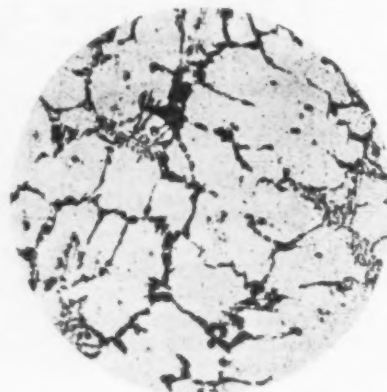


Fig. 34—An 8 Per Cent Copper Alloy, Sand Cast at 700 Deg. C. Etched in sodium hydroxide. X 100

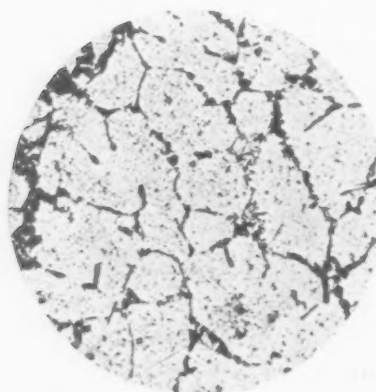


Fig. 35—Same Alloy as Fig. 34, "Nitric Acid Quench." X 100



Fig. 36—Same Alloy as Fig. 34, Etched With Hydrofluoric and Hydrochloric Acids (Fink's). X 100



Fig. 37—Same Alloy as Fig. 34, Etched With Hydrofluoric and Nitric Acids in Glycerine. X 100

the differentiation between the last three compounds, as these are similarly attacked. A 20 per cent solution can be used for detecting iron aluminide in wrought aluminum. Very dilute solutions (0.10 per cent NaOH) are suggested to detect iron aluminide in aluminum-silicon alloys.

The Class II Reagents

Solutions of Hydrofluoric Acid: These are employed for revealing the grain structures of aluminum alloys. The original reagent of Brislee, consisting of a 12 per cent aqueous solution, has been modified by others. Czochralsky obtained good development of the grain structure by etching with hydrofluoric acid, followed by hydrochloric acid. Flick combined the two acids in one solution and improved the etching considerably.

Specimens etched with hydrofluoric acid are invariably covered with a black deposit of unknown nature

and require cleaning in nitric or chromic acids. Hydrofluoric acid reagents are characterized by a marked tendency to pit the etched surface, probably by attacking the small particles of iron aluminide that occur within the grains.

Solutions of Sodium Hydroxide: Solutions containing between 5 and 20 per cent caustic soda are widely used as reagents for developing the microstructure of aluminum and its light alloys. The grain structure of substantially pure aluminum can be developed in about one minute in a 20 per cent solution; in cases where iron aluminide has been rejected to the grain boundaries, an immersion of 30 sec. suffices to give the desired results. These reagents also deposit a black smudge on the etched surface and, as in the case of hydrofluoric acid, etching must be followed by an immersion in nitric or chromic acid in order to make the structure visible.

It will be noted that solutions of sodium hydroxide

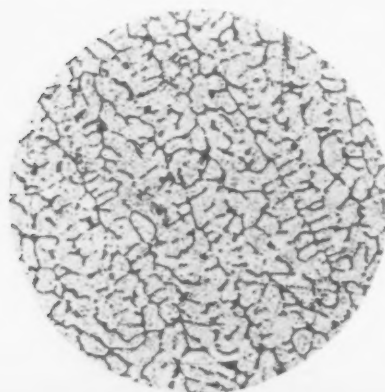


Fig. 38—Aluminum With 0.4 Per Cent Iron; Chill Cast. X 100. (At left)

Fig. 39—A 4.4 Per Cent Iron Alloy, Showing Primary Crystals of Iron Aluminide. X 100



are employed both for differentiating between compounds and developing the microstructure, but also that there is no concentration capable of performing both functions simultaneously.

Perfecting a New Reagent

From the brief critical review just concluded it may be seen that, while each one of the reagents discussed possesses certain merits, none in itself is complete in its etching action. A question now arises: Is it possible by combining a reagent of class I with one of class II to produce a new reagent capable of differentiating between compounds and at the same time of developing the microstructure?

At first glance it will be seen that, in combining any two of the reagents mentioned, all alkaline solutions have to be eliminated, since they cannot be mixed with any other without bringing about a chemical reaction that would destroy their properties. This elimination leaves hydrofluoric acid in class II and nitric acid and ferric sulphate in class I. Of the last two, nitric acid is the logical choice: First, because it mixes with



Fig. 40—Magnalite, Sand Cast, Showing X Constituent and Copper Aluminide. X 500

hydrofluoric acid without reacting chemically; second, for its ability to dissolve the smudge left on the etched surface by hydrofluoric acid, and third, because it is more efficient in differentiating between compounds.

On trying various combinations of these acids it was found that the mixtures in aqueous solution did not combine the properties of both acids. The failure was attributed to the fact that the corrosive action of hydrofluoric was enhanced by the presence of nitric acid to such an extent that the compounds were totally etched out before the structure could be developed to any satisfactory degree, even when used cold. It was deemed necessary, then, to find a way of slowing down the action of the mixture.

The experience gained by the use of solutions of aqua regia in glycerine for etching iron-chromium alloys immediately suggested the use of this solvent. A study of the physical and chemical properties of glycerine proved it to be the logical solvent to accomplish the desired effect. By virtue of its high viscosity glycerine decreases the velocity of the ions and molecules of electrolytes dissolved in it, while the electrolytes themselves are less dissociated than if dissolved in water, by reason of the lower dielectric constant of glycerine.

The reagent thus developed consists of 1 part of nitric and 2 parts of hydrofluoric acid dissolved in glycerine. The acid strength of the solution and the length of the attack cannot be definitely given because different alloys require different concentrations, but a solution consisting of

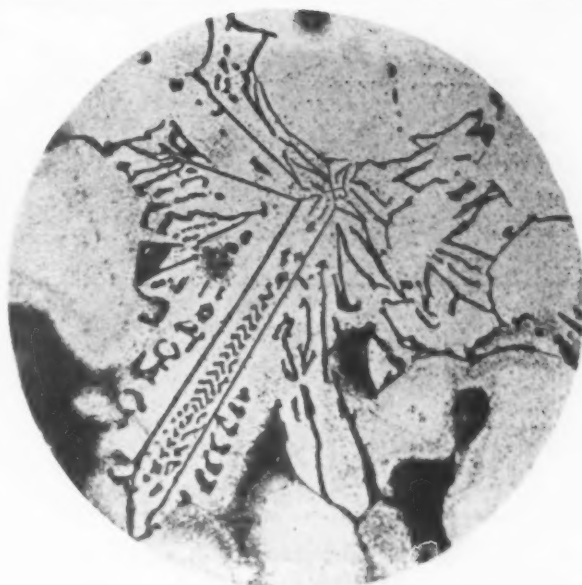


Fig. 41—Aluminum-Copper-Zinc Alloy, Sand Cast. Unusual type of "Chinese script" structure. X 250

- 1 part nitric acid by volume
- 2 parts hydrofluoric acid by volume
- 3 parts glycerine

has been found satisfactory for etching a large variety of alloys and is offered as an example. The reagent is conveniently prepared in a graduate cylinder lined with paraffin, and practical containers to hold the reagent during the etching operation may be made from the bottom part of regular hydrofluoric acid bottles.

When the action of the reagent is slow at the start, the specimen may be warmed in hot water and etched without drying. The film of water adhering to the surface and the heat retained by the specimen counteract the slowing effect of glycerine and bring about a rapid start of the reaction.

Development of the Microstructures: The method of alternate polishing and etching described in the first part of this discussion (THE IRON AGE, March 18) is applicable to aluminum and its alloys to the same extent that it is to the iron-chromium alloys; in fact, it is essential to the proper development of the grain structure of pure aluminum or annealed wrought alloys. (See Figs. 28 to 31.)

The reagent and the method of alternate polishing

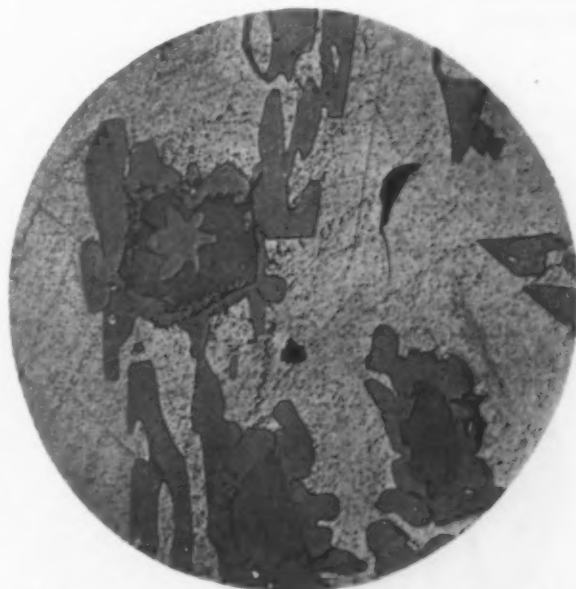


Fig. 42—Duplex Aluminide in an Alloy Containing 2.5 Per Cent Manganese and 2.5 Per Cent Iron. X 100

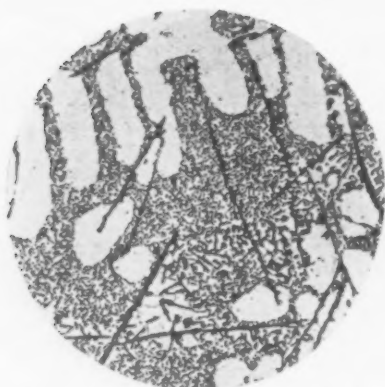


Fig. 43—Aluminum Alloy Containing 9.3 Per Cent Silicon and 1.1 Per Cent Iron. X 100



Fig. 44—Aluminum Alloy Containing 9.3 Per Cent Silicon and 1.7 Per Cent Iron. X 100

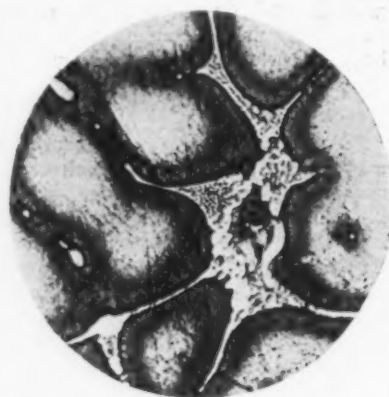


Fig. 45—A 5 Per Cent Copper Alloy, Sand Cast, Showing Cored Structure and Copper Aluminae. X 250

and etching can be employed for revealing finely divided precipitates in heat-treated aluminum alloys. (See Figs. 32 and 33). The new reagent, by attacking the ground-mass in preference to the compounds, makes possible the development of core structures without impairing the identity of the compounds. In this respect it is vastly superior to any other known reagent.

The specimen was prepared in all cases under the same conditions and the apparent more careful finish of Fig. 37 is due only to the fact that the glycerine reagent removes the scratches by attacking the ground-mass, while the other reagents limited their action to the compounds.

Identification of Constituents: The selective action of the reagent renders possible its application as a means of identifying the various constituents of aluminum alloys by their characteristic colors. To obtain maximum color differences, the field should be illuminated with white light and examined with the aid of an 8-mm. objective. Certain compounds are not attacked by the reagent and exhibit their natural colors, while coloration in others is the result of films formed on their surfaces. These films reflect different colors according to their thickness, which in turn depends on the length of the attack, the strength of the reagent and the size of the particles on which they form. For these reasons, identifications based solely on color differences are not always dependable.

Occurrence and Identification of Iron: Iron occurs in aluminum alloys in at least six different forms, and possibly seven if the existence of an iron-aluminum solid solution containing less than 0.15 per cent iron is granted:

1.—Iron occurs as eutectic iron aluminide in alloys containing as high as 2.5 per cent iron. In this form it is not attacked by the reagent and can be identified by its characteristic eutectic formation and its natural purple tinge.

2.—Iron occurs as primary crystals (star-like aggregates) of iron aluminide (FeAl_3) in alloys containing over 2.5 per cent iron. These

are not attacked by the reagent and appear light blue gray in color.

3.—As X constituent in alloys containing over 0.30 per cent silicon and 0.30 per cent iron. This compound forms more frequently in alloys containing over 2 per cent copper and is usually found associated with copper aluminide. It can be readily identified by its characteristic acicular formation and its reddish brown color.

4.—In alloys containing 0.30 per cent silicon and 1 per cent copper, iron occurs also in the form commonly known as "Chinese script" structures. On etching with the glycerine reagent this compound is covered with a film which reflects a deep blue violet color in the narrow places of the structure and sometimes a variety of colors ranging from green to red in the wider areas. While the X constituent occurs at the edge of the grains, the "Chinese script" is always found in the cores and never associated with either copper aluminide or X constituent.

5.—In alloys containing manganese, iron seems to form a complex aluminide of iron and manganese which is not attacked by the reagent and appears of a watery blue color. Duplex crystals of this double aluminide occur quite frequently, one phase etching slate gray and the other maintaining the blue color.

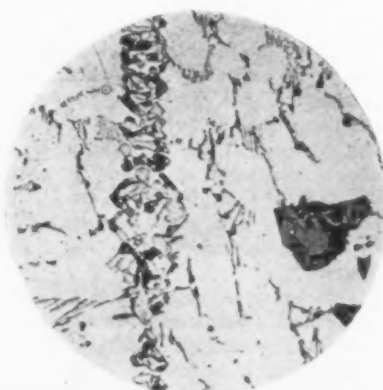
6.—In high silicon alloys containing above 1 per cent iron, this element occurs in the form of long, thin needles. These needles act as nuclei for the crystallization of silicon and for that reason appear enveloped in a sheath of silicon. The size of these needles, but not their number, is increased by raising the percentage of iron. At places where the needles have been broken or ground to the core during the polishing operation, iron becomes visible, appearing then deep blue in color, similar to the material composing the "Chinese scripts."

Occurrence and Identification of Copper: Copper occurs in the light alloys of aluminum as a solid solution when in concentrations below 2 per cent copper and as copper aluminide (CuAl_2), the excess above this



Fig. 46—A 2.5 Per Cent Nickel, 2.5 Per Cent Iron Alloy, Sand Cast and Showing Cored Crystals of What Probably Is a Complex Aluminide of Iron and Nickel. X 250 (At left)

Fig. 47—A 2.5 Per Cent Nickel, 2.5 Per Cent Manganese Alloy, Sand Cast, Showing Manganese Aluminide, Nickel Aluminide and Isolated Crystals of a Complex Nickel-Manganese Aluminide. X 100



percentage. Copper aluminide, not being attacked by the reagent, retains its natural pink tinge. It always occurs at the edge of the grains in the center of that part of the solid solution which is richest in copper.

Differentiation Between Iron, Nickel and Manganese Aluminide: To test the ability of the reagent to differentiate between iron, nickel and manganese aluminide, three alloys were prepared. Their approximate composition is as follows:

Alloy 1.—2.5 per cent iron and 2.5 per cent manganese.

Alloy 2.—2.5 per cent iron and 2.5 per cent nickel.

Alloy 3.—2.5 per cent nickel and 2.5 per cent manganese.

The iron-manganese alloy has been discussed and its structure shown in Fig. 42. The structure of the iron-nickel alloy is shown in Fig. 46. This particular

casting exhibits crystals of what probably is a double aluminide of iron and nickel. Some crystals are cored, the outer part etching of a deep blue color while the core appears brownish red.

The structure of the nickel-manganese alloy is shown in Fig. 47. It consists of three distinct constituents. The broken up crystals resembling disjointed vertebrae are characteristic formations of manganese aluminide. These etch light blue. The isolated crystals are probably a double aluminide of nickel and manganese and etch brownish-gray. The third compound is nickel aluminide. Its eutectic formation is typical. It etches brown.

Grateful acknowledgment is made of the very considerable assistance furnished by M. G. Corson, who provided the specimens and aided in the metallographic interpretations, also by Dr. T. W. B. Welsh, who offered valuable suggestions, and D. Beregekoff, who prepared the specimens.

British Study Non-Ferrous Problems

Recent Developments in Copper, Bronze and Aluminum Discussed by Institute of Metals, Including Die Casting and Macrostructure

SPECIAL CORRESPONDENCE

LONDON, ENGLAND, March 16.—At the annual meeting of Institute of Metals, held in London on March 10 and 11, it was announced that Sir John Deurance had been elected to succeed Prof. T. Turner as president. Engineer Vice-Admiral Sir Robert B. Dixon, Sir Thomas Rose and W. Murray Morrison are the new vice-presidents. The international growth of the institute is one of the important features of the year and, with the conclusion of the Locarno Agreement, German members are beginning once again to resume membership. The roll of members in the United States is a very large and increasing one and, while the appreciation of the institute by foreign scientists and manufacturers is very acceptable, a larger application for membership from persons resident in the British Isles would be welcomed. The growth during the past year of 121—the largest since the war—brings the total membership up to 1692.

The usual presidential address was deferred until the 1927 meeting, and the main business of the meeting was concerned with the presentation of a large number of papers, the more important of which are summarized below:

Hardness of Cold-Rolled Copper

Hardness tests of two series of cold-rolled copper bars are reported in detail, one which had received a 2 per cent and one a 10 per cent reduction in thickness per pass were discussed by Dr. Samuel L. Hoyt and T. R. Schermerhorn, General Electric Co., Schenectady, N. Y. These confirm the old or "conventional" form of relationship between the degree of working and the hardness. In neither case did the authors find either the anomaly noted by Alkins (the "Alkins" effect) or the reversal noted by Rawdon and Mutchler. However, they do believe that they have observed a well-pronounced Alkins effect on another series with heavier reductions, not recorded here. The deviations from a smooth curve which may be seen on the hardness curves is considered due to unavoidable experimental errors. The draft per pass had only a subordinate effect on the hardness, but in the two cases reported in detail, the 10 per cent reductions have a greater increase in hardness than did the 2 per cent reduction per pass.

The hardness over the cross section was found to be uniform for reductions above 20 per cent. At the start, with small reductions, the authors found the top surface to be harder than the side of the test bar. This difference disappeared at about 10 to 20 per cent reduction.

Brittle Ranges of Bronze

In a paper, "The Brittle Ranges of Bronze," by W. L. Kent, the brittle ranges of cast and annealed bronzes containing up to 25 per cent of tin were investigated, using the Izod impact test in the manner employed by Bunting, and the results correlated with the known facts concerning the workability of the alloys.

It was shown that alloys in the alpha range were brittle at high temperatures, while those containing the alpha plus delta eutectoid, which are hard and brittle at ordinary temperatures, become softer and tougher above 520 deg. C. due to the formation of beta, which takes place at that temperature. The maximum toughness occurred in the neighborhood of 600 deg. C.—an observation which is in agreement with the results of different tests performed by other workers.

Special Electric Furnace and Gases at High Temperatures

A paper by A. G. Lobley and D. Jepson, "The Influence of Gases at High Temperatures," describes briefly a special type of electric resistance furnace, in which the resistor is a plain carbon tube mounted vertically in water-cooled electrodes. The furnace can be evacuated, or filled with any desired gas, and an arrangement is provided by which a crucible containing the metal under treatment can be lowered from the heating zone into a water-cooled compartment, thus giving a very rapid and reproducible rate of cooling.

Electrolytic copper was heated in atmospheres of nitrogen, hydrogen and carbon monoxide, respectively, to various temperatures between its melting point, 1084 deg. C., and its boiling point, 2310 deg. C., being kept at the given temperature for a period of 30 min. The metal was then cooled rapidly in the manner stated, and examined for blowhole volume, hardness and macrostructure.

It was shown that nitrogen and carbon monoxide are not absorbed by molten copper up to temperatures of 1900 and 1700 deg. C., respectively, in excess of that soluble in the solid metal. Hydrogen, on the other hand, is absorbed to a varying degree at all temperatures up to approximately 2200 deg. C., and the excess over that soluble in solid copper is ejected on solidification forming blowholes. The amount of gas thus held appears to bear a definite relation to the solubility of the gas at the temperature under consideration.

The macrostructure showed certain changes in the

grain size regarding which further investigation is required. The Brinell numbers were found not to vary beyond the limits of experimental error from an average value of 55 with either temperature or the nature of the gas to which the metal was subjected.

Copper-Rich Alloys

The effect of tin up to 9 per cent by weight on the structure of the yellow aluminum-copper alloys is discussed in a paper, "The Copper Rich Aluminum-Copper-Tin Alloys," by D. D. Stockdale. A remarkable feature of these ternary alloys is the manner in which the two binary systems merge into each other. There is no abrupt change in a series of solid solutions and the difference between the structure of a beta-bronze and a beta-aluminum-copper solid solution, for example, is small.

In a certain small number of these alloys the eutectoid transformation does not take place, but near 600 deg. C. the ordinary beta-solid solution changes over to a second solid solution indistinguishable microscopically from the first. A proportion of the solid solution poor in copper may dissolve in this new constituent, and, on further cooling, the copper-rich alpha-phase separates out, but the mother constituent persists down to the ordinary temperature. It is for this reason and also because tin has a retarding influence on the ordinary eutectoid transformation in the aluminum-copper alloys that there are grounds for hoping that a ternary alloy for practical use may be found which will possess the advantages, with none of the disadvantages, of "aluminum-bronze."

Aluminum Alloys for Die Casting

From the utility standpoint one of the interesting attributes of the metal aluminum is the ease with which its alloys may be "die cast," says George Mortimer in a paper, "Die Casting of Aluminum Alloys." The economic value of die casting in general is now widely admitted and need not be unduly stressed here. It is so generally recognized that the die casting of brass and the bronzes has received close and costly attention of late, while in America at least one firm is successfully producing iron castings from permanent molds.

Neither in brass nor in iron, however, is the operation carried out with any of the specifications for aluminum casting alloys, nor do the molds cost so little or last so long. This fact, coupled with the designers' long experience of these alloys under all sorts of service conditions, has been one of the more active influences in the very striking developments which have taken place in the past decade, in the application of die castings to engineering and industrial uses.

The development in the use of die castings in Europe and America has not only been remarkably rapid, but has also inevitably proceeded on lines most suited to

the conditions obtaining in different countries. Inevitably, also, a certain confusion arises in regard to the possibilities, technical and economical, of the different systems employed. The present paper is intended simply to crystalize the ideas of those who are interested in die castings, yet who are kept too fully occupied in their own legitimate sphere to keep in touch with developments in specialized branches of engineering.

Macrostructure of Cast Metals

The interpretation of the structure of cast metals and alloys has depended mainly on empirical observation. While in the case of steel the macrostructural characteristics of a casting give definite information regarding casting conditions, the same indications cannot be applied directly to cast specimens of non-ferrous alloys, particularly to those consisting largely of copper, which solidify rapidly.

The work described by R. Genders in a paper, "The Macrostructure of Cast Metals," has the aim of establishing grounds upon which a more general interpretation of the macrostructure of metals, and consequent knowledge of the mechanism of the solidification of a casting, can be based. In copper alloys of high thermal conductivity, solidification occurs concurrently with pouring and the flow of metal within the mold becomes of primary importance in governing the mode of crystallization.

Experimental slab ingots 12 x 6 x 1 in. were made of two alloys of similar physical characteristics, but of different color, melted in separate crucibles. By the use of a specially designed pouring trough, the metal passed into the mold in an unbroken stream while the alloy comprising the stream could be changed at any prearranged stage by varying the amounts of metal in the two crucibles. The disposition of the color zones distinguishable on sections from the ingots indicated that the process of formation of the ingot from the stream was one of continuous displacement of metal in the path of the stream to the faces of the mold. Several sets of casting condition, covering most of those used industrially, were included in the experimental work. The conclusions drawn concerning the mechanism of the formation of a casting permit of the interpretation of many peculiar features observed in the structures of ingots of copper alloys.

Other papers include one on "Silver-Tin Alloys" by A. J. Murphy, dealing with dental amalgams; one on "The Softening of Strain-Hardened Metals" by R. W. Bailey and one on "The Mechanical Properties of an Alloy of Nickel and Copper" by H. J. Tapnell and J. Bradley, which deals with the results of some mechanical tests of a synthetic alloy of nickel and copper (approximately 70:30) containing 2.35 per cent manganese. Special attention is given to the study of the "creep" of the nickel-copper alloy.

Electrochemists to Hold Spring Meeting in Chicago

The American Electrochemical Society will hold its annual convention at the Chicago Beach Hotel, April 22 to 24, Chicago. The local committee on arrangements includes the following members: Dr. H. C. Cooper, chairman; Prof. S. C. Langdon, secretary; R. G. Bowman, William Bray, E. W. Engle, W. R. Fetzner, Edward Gudeman, William Hoskins, G. H. Jones, W. Bartlett Jones, H. N. McCoy, H. T. McKay, A. F. McLeod, George R. Mitten, W. W. Murray, A. J. Weith and Fred E. Winslow.

The main attraction of the technical program is a symposium on chlorine. Japan has contributed four papers to the symposium. Different phases of the chlorine industry in America are covered by a number of other authors. Among these are some on the chlorination of metals, an industry which is gaining rapidly in importance. This is described by Paul S. Brallier, chief chemist Niagara Smelting Corporation. Chlorine is used in the detinning of tin plate scrap, producing tin or tin salts, commercially valuable from a by-product otherwise an economic loss. This subject has absorbed

the attention of Charles L. Mantell, of New York, for several years, and in his paper he discusses the various commercial processes and the cost of operation.

The Saturday morning session of the meeting April 24, will be devoted to papers on electrolytic refining and plating of metals. On Friday morning, April 23, the retiring president, Dr. F. M. Becket, vice-president of the Electro Metallurgical Co., New York, will deliver an address on "Modern Requirements in the Education of an Engineer." Following this address and the annual business session, the meeting will be devoted to miscellaneous electrochemical papers on the corrosion of iron and other subjects.

The luncheon Thursday noon, April 22, will be devoted to round table discussions: One on the "Selection of Proper Plating Metals," the other on "Comparative Merits of Electric and Fuel-Fired Furnaces," in charge of William J. Priestley, of the Electro Metallurgical Co.

There will be two general lectures on Thursday and Friday evenings. The lecture on Friday evening will follow a joint dinner of the American Electrochemical Society with the Chicago section of the American Chemical Society. The local committee has arranged for visits to industrial plants in the vicinity.

Easy Handling in Planer Works

Heavy and Cumbersome Units Going Through Plant
Formed a Problem—Transfer Between Bays
Effected on Operating Tools

BY BURNHAM FINNEY*

HAVING ample floor space for the handling of unusually large castings, and departments so inter-related that material moves among them with a minimum of effort and with the greatest possible saving of time, the new plant of the G. A. Gray Co., Cincinnati, designed especially for the manufacture of metal planers, has many features deserving comment.

In planning its building the company was confronted with the necessity of erecting a shop sufficiently large so that planer beds, frequently 40 ft. in length, and finished machines, often weighing 50 tons or more, could be machined, transferred from one department to another, and assembled with ease. This task could be accomplished only by providing floor space free from columns.

Such requirements have been embodied in the main portion of the plant, which consists of two parallel bays. The larger, or main, bay is 420 ft. long and 60 ft. wide, with a clearance of 25 ft. under the crane hooks; the smaller, or north, bay is 400 ft. long and 50 ft. wide and affords a clearance of 18 ft. under the crane hooks.

Castings from the Gray foundry are delivered, by means of a railroad spur track, within the western end of the main bay, where they are stored. After being cleaned, they pass down the bay to the planers, which are set crosswise of the bay and which extend partly into the north bay, so that a casting placed on a planer in the large bay can be removed by the crane in the north bay. Planer beds and tables, after being machined on the large planers, move down either the north or the south side of the large bay, over the horizontal boring machine and under the radial drills, going from the latter to the erecting floor at the eastern end of the shop.

With planer tables acting as a transfer agent, the housings move from the main bay into the north bay and thence by various stages to the erecting floor. The assembly of rails, rail heads, side heads and top braces is accomplished in the north bay. The work there is done so completely that it is a simple matter to erect the complete planer by assembling these portions on the large castings.

Running into the main bay from the south are four

side bays, each of which is 100 ft. long and 40 ft. wide. They alternate high and low, thereby giving opportunity for large windows and plenty of light. They house the small planer, lathe, turret lathe, gear cutting, grinding and tool room departments. The latter is situated near the radial drill, gear cutting and lathe departments, which require the most service.

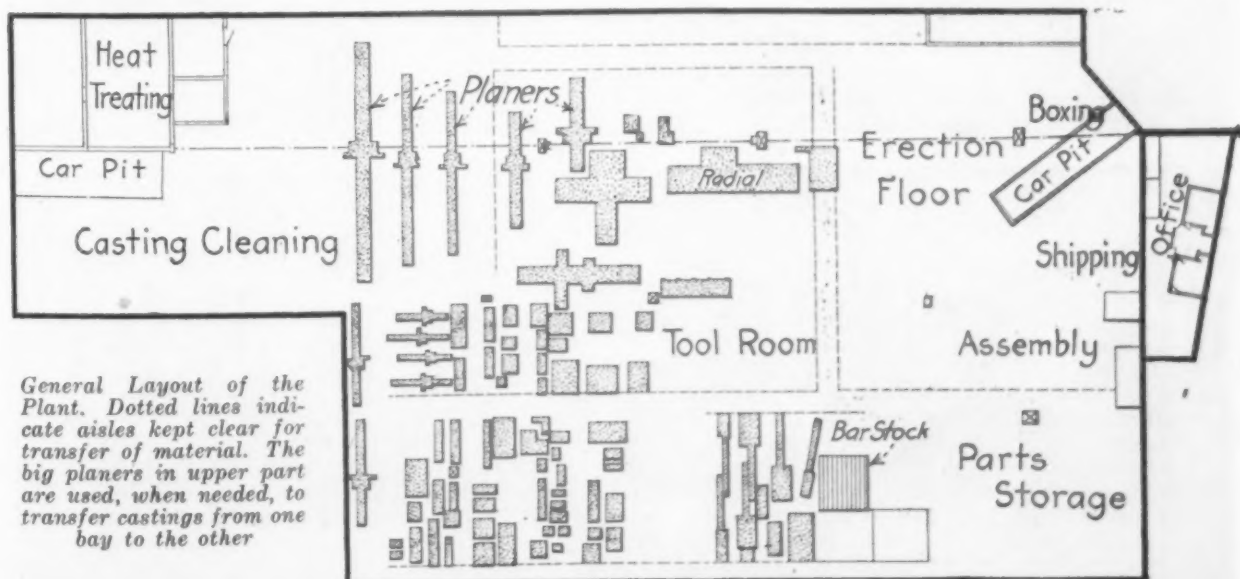
Since all planer parts are made in quantities, planers being assembled from material in stock, considerable importance is attached to the tool room in the southeast corner of the plant. As the G. A. Gray Co. is furnishing repair parts from stock for planers built in the past 46 years, the value of the department is enhanced.

Unusual care has been exercised in equipping the plant with electrical facilities. For those heavy machines with a reversible motor drive and for the advantage of the adjustable speed motor on lathes, turret lathes and radial drills, a General Electric synchronous converter has been employed. It is supplied with alternating current from the transformers at 220 volts, 6-phase, 60 cycle, and furnishes direct current at 125 and 250 volts, 880 amperes.

Junction boxes of generous capacity on each column make the direct current, as well as alternating current, instantly available, so that machines can be installed at any place in the shop without difficulty, and can be arranged according to production requirements and according to the flow of material through the shop, without reference to minor considerations of wiring. This detail illustrates the care with which the entire plant has been laid out, to give a maximum of elasticity and to permit easy changes in arrangement or in equipment, if new ideas in management arise or if there are new developments in the machines used.

The lighting plan for the shop embodies the most scientific modern practices. During the day the lighting is remarkably satisfactory. The entire north wall of the plant is an unbroken expanse of glass, 22 ft. high. The clear glass of the lower panes permits a glimpse of Victory Boulevard nearby; the upper panes are of hammered glass to prevent too much of the artificial light at night from passing out of the shop. The photograph of the turret lathe department gives a good conception of the conditions of light. The necessity for

*THE IRON AGE, Cincinnati.



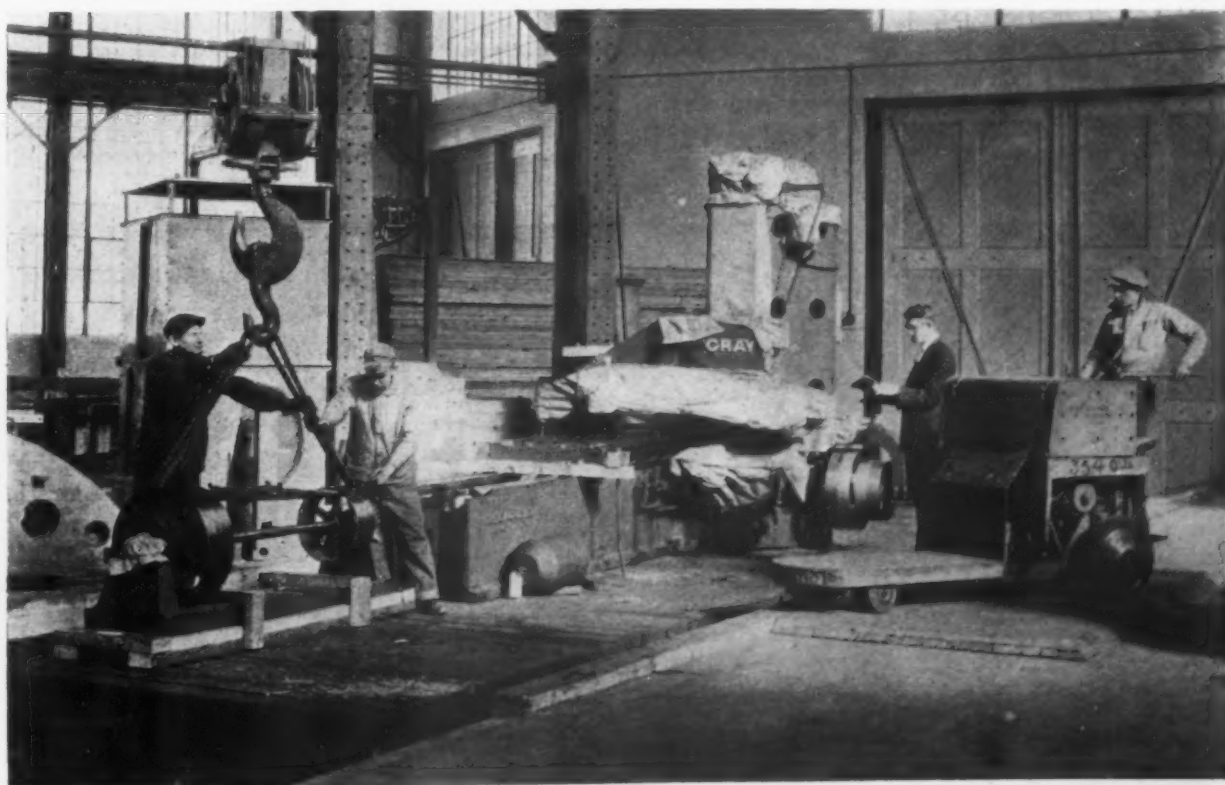


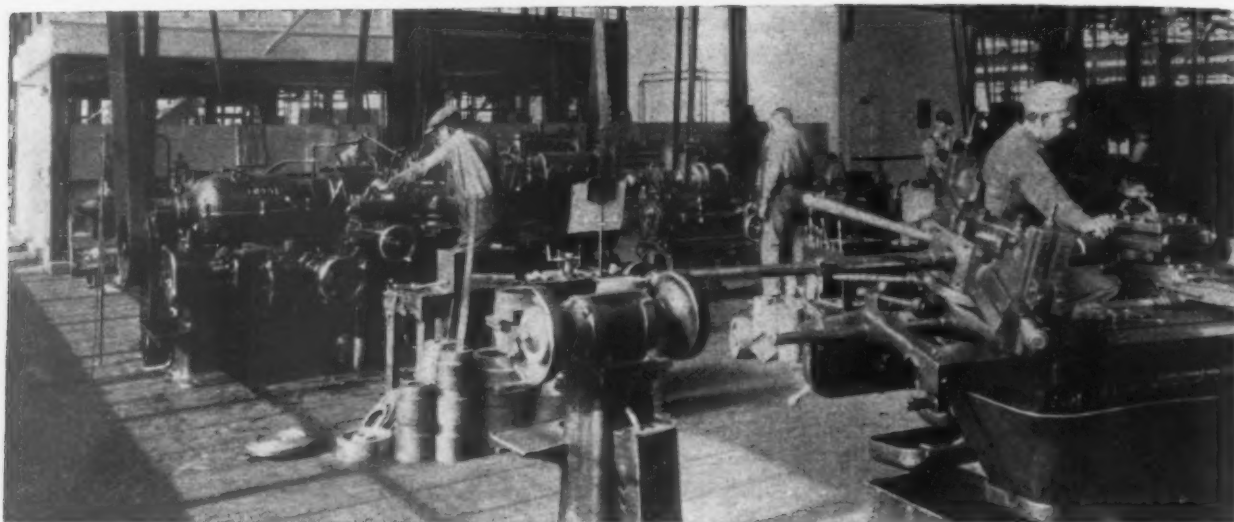


In the New Planer Plant of the G. A. Gray Co.

AT top of the opposite page is the rail and top brace assembly division; the view was taken looking east along the north wall. Next below is the small planer department, looking toward the large planers in the main bay. The third photograph shows assembly of big machines in the main bay. At the bottom is the assembly floor for large planers, in the main bay of the new shop.

At top of this page is shown the tool room. The shipping department, at the bottom, has space for one car at a time. The track here is arranged for motor truck use also, when required.





Turret Lathe Department, Showing the Excellent Lighting Obtained by Means of the Large Glass Area

measuring, to a high degree of accuracy, the inside bore of many parts makes good lighting of special importance on these machines.

The main and north bays have 500-watt lighting outlets, using standard dome reflectors, spaced at a distance of 20 ft. and mounted at a height just sufficient to clear the traveling cranes. The side bays are lighted from 500-watt outlets, spaced 20 ft. apart and mounted at a height of 21 ft. Those sections in the side bays where smaller machines are operated are provided with 200-watt outlets, spaced 10 ft. apart, and mounted only 11½ ft. from the floor.

Installation of an indirect unit system of heating, consisting of seven Sirocco blowers driven by 3-hp. double-end blower fans, adds to the comfort of employees. These units placed about the shop are sufficient to maintain proper temperature in extremely cold weather, yet flexible enough to provide economical heating in moderate weather. Steam is supplied at low pressure by two No. 128 Heggie-Simplex boilers, with automatic motor-driven return pumps. These have sufficient capacity to provide for future expansion of the plant.

Movement of material through the shop is facilitated by ample crane equipment. The main bay is served by two 20-ton electric cranes and a 5-ton auxiliary crane, while the north bay has a 15-ton electric crane. Three-ton and 6-ton cranes and numerous gib cranes serve the side bays.

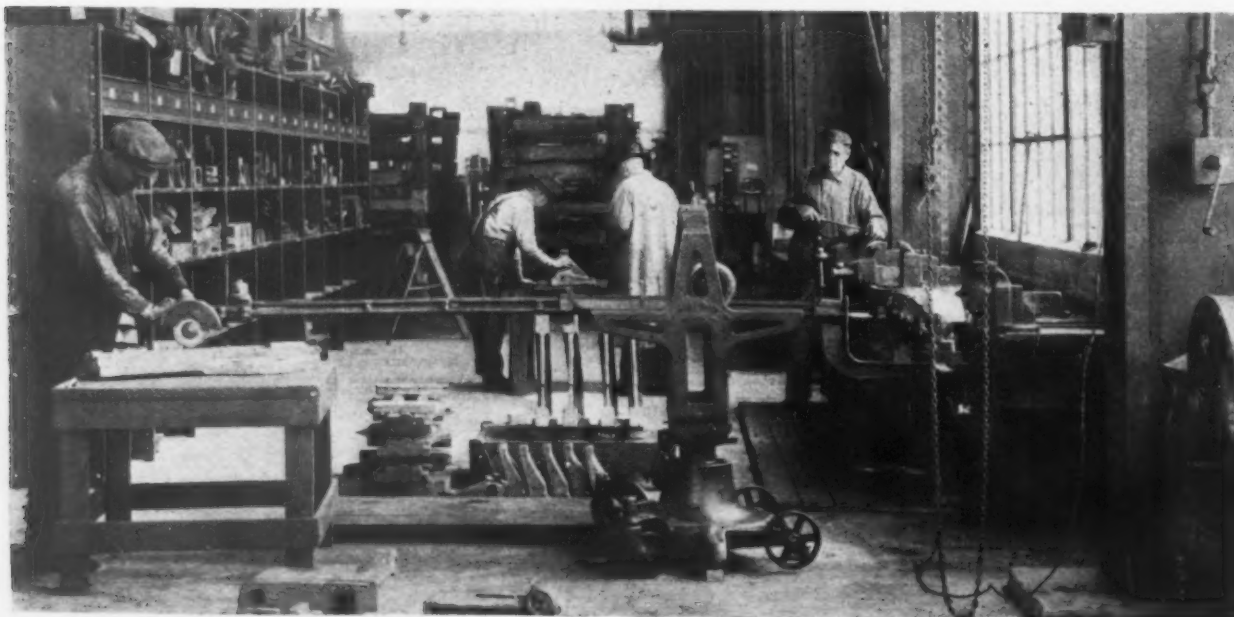
Two railroad side tracks, one in the main bay and

one in the north bay at the eastern end of the plant, permit the convenient shipping of the finished planers. The top of the flat cars is on a level with the floor of the shop. The roadbed between the tracks is laid with "tarvia" to the top of the rails, thus allowing deliveries and shipments by motor trucks as well as by railroad.

Washroom and lavatory facilities are situated at the center of population of the shop, where they are easily accessible to all of the workmen. There is also a small plant hospital, equipped to care for employees in case of accidents or sickness. The plant was designed and erected by the Austin Co., Cleveland.

As briefly described in our issue of April 2, 1925, the plant is located on a seven-acre tract in Evanston, a part of Cincinnati lying north of the center and between Walnut Hills and Norwood. The railroad service is from the Cincinnati, Lebanon & Northern Division of the Pennsylvania. The plant as a whole consists of a steel frame building, 420 ft. long and 210 ft. wide, divided into bays as outlined previously.

Space is reserved for a foundry, which remains in the present location until arrangements are made a little later for placing it contiguous to the machine shop sections now in operation. The office is housed in a two-story brick building at the eastern end of the shop. Engineering and production departments occupy the second floor, while the sales, accounting and administrative offices are on the first floor. The heating plant is in a separate building at the southwest corner of the group.



Cleaning Castings in the Main Bay. The photograph was taken with the camera pointed toward the east

United States Aircraft Carrier Langley (Converted from a Collier) with a Dozen Airplanes on Deck. In background is the destroyer Somers—one of a large fleet built during the war to combat German submarines



The Navy and the Steel Industry

II.—Pioneering in Large Steel Castings—Blazing the Way for Railroad Castings—Development of Armor and Gun Forgings

BY G. K. SPENCER*

ONE of the most difficult and expensive problems encountered by John Roach, when he undertook the building of the first ships of the new steel Navy in 1883, was the construction of the stern frame for the Chicago. At that time this important part of a ship had to be forged, as the steel-castings industry, scarcely even in its infancy, could not supply castings for this purpose. Only small parts were made of cast steel and the engineering profession had no confidence in this material.

One day in 1885 the Secretary of the Navy, William C. Whitney, visited Roach's shipyard in Chester, Pa., where the Chicago was being built. In discussing the great difficulty of making a satisfactory stern frame forging for the vessel, Naval Constructor Lewis Nixon (later, the designer of the Oregon) suggested to Mr. Whitney that stern frames on future vessels be made of cast steel. This was a bold suggestion, as no structural

steel castings of such size had been attempted before.

As a result of this conversation Mr. Nixon was detailed to investigate the possibility in the future of making such parts of cast steel. No steel foundry at that time had either melting capacity or annealing ovens of sufficient size to handle such large castings. However, the foundrymen had confidence in their product, and were anxious to make the attempt, offering to increase their equipment as necessary to produce stern frames.

After much opposition from the more conservative engineering element, both in and out of the Navy, the stern frame for the Charleston was specified by the Bureau of Construction and Repair to be made of cast steel. Much difficulty was experienced in making and annealing the casting. Finally, in 1887, the Midvale Steel works delivered a satisfactory casting for the purpose. This piece weighed 6720 lb. and may be said to mark the beginning of the cast-steel industry, be-

*San Diego, Cal.

STEEL castings of dependable character began to be used in place of forgings for certain parts of machinery and ships' structures at about the time that open-hearth steel began in a vigorous way to displace Bessemer steel for structural purposes. In this second section of the article depicting the intimate inter-relationship between the United States Navy and the development of the American steel industry, some of the outstanding features attending the introduction of steel castings and their development into dependable entities are outlined. Resulting from this development, over a period of four decades, we have seen the steel castings production of this country multiply by 1000.

Alongside the castings development was a similar development of forging processes and machinery. Armor and guns, of specifications now common, were an utter impossibility with the steel industry at the stage which it occupied in 1883. Demand for the highest quality of material, together with helpful cooperation in experimental and development work on the part of the Navy Department, have been largely responsible for the advancement in our metallurgical and mechanical processes required to satisfy present specifications.



Naval Amphibious Tank on the "Back" of a Submarine Moving Inshore for a Landing. To bring the tank into action the submarine submerges, leaving the tank afloat. It then proceeds under its own power to the beach, up which it climbs by means of its caterpillar tread

cause of the influence it had in bringing the railroads around to the use of such material.

Locomotive Frames of Cast Steel

This phase of the development of the steel-castings industry deserves some additional comment. At the Chicago Exposition, in 1893, Krupp exhibited some steel castings which at that time were considered remarkable, among them being a cast-steel frame for a Pennsylvania Railroad locomotive. At a meeting of the American Society of Mechanical Engineers doubt was expressed as to whether any American steel foundry could make such a casting. It was then pointed out that the Navy was using steel castings for stem and stern frames of naval vessels; that these castings were, with each class of ship, increasing in size and complexity of shape; and that they were satisfactorily

passing the Navy Department tests, which were well known to be severe and guarantees of good material.

With the Navy leading the way, the railroads gradually swung around to the use of steel castings for locomotive frames and other structural parts. There is no doubt that the remarkable development of railroad locomotives and rolling stock in the United States can be traced in great measure to the adoption of steel castings for locomotive frames and other parts. The difficulty, cost, and perhaps impossibility of making locomotive frames by the forging process, of such sizes as are now used, would have set a limit on this development.

It is interesting to note that in 1883 the total production of steel castings in the United States was only 1684 tons, and that this output has risen to almost 2,000,000 tons annually. The Navy by its early ex-



Naval Amphibious Tank Going Ashore in Hawaii to Make an "Attack." This curious device, with its gun protruding to the reader's left, can propel itself through the water as well as upon land. It accompanies a submarine, diving with it when necessary

ample stimulated and encouraged the steel-castings industry and in turn advanced by many years the use of such castings by the railroads.

Development of the Steel Industry

The history of armor development alone is of the greatest interest. Prior to 1890 there were no plants in this country capable of turning out heavy forgings of either wrought iron or steel. Our heavy forgings were produced abroad. Many attempts had been made to forge large shafting under the hammer—the only means available at that time—but the product was not satisfactory, for the thick masses of steel could not be penetrated by the blow of the hammer. Cracks could not be eliminated in the interior and the forgings were naturally unfit for use.

With the improvement in range and hitting power of heavy guns came the necessity for defense, and armor plate was the logical resort. The world was searched for methods of manufacture of suitable armor plate. In this search and subsequent laboratory investigations of the effect of alloying steel with various other ingredients, and of novel heat treatments of steel, there were discovered or evolved many of the special alloys

to build a plant in the United States, the Whitworth Works furnishing the plans.

First Armor Plant in America

After the board returned home, Lieutenant Jaques took up with John Fritz, general superintendent of the Bethlehem Iron Co., the question of building at Bethlehem the forging plant for which he had contracted with Sir Joseph Whitworth. Mr. Fritz, much interested, after considerable difficulty persuaded the directors of the Bethlehem Iron Co. to undertake the project. The result was the first armor plant in this country.

While construction was under way, Lieutenant Jaques and Mr. Fritz made frequent trips to Europe to visit the Whitworth and other plants. In France in 1887 they obtained from the Creusot Works a contract permitting them to manufacture certain armor in accordance with the most advanced methods of armor manufacture then in vogue. On June 1, 1887, the United States Government placed its first contract for armor with an American concern, the Bethlehem Iron Co. This company, then a small operation, expanded greatly, finally becoming the Bethlehem Steel Corpo-

Torpedomen at Work on Their Deadly Self-Propelling Projectiles. In foreground is one of the double propellers, one set of blades arranged to revolve "clockwise" while the other revolves "counter-clockwise." This is necessary, to avoid having the propeller reaction roll the torpedo over, thus destroying its aim



of iron with nickel, chrome, vanadium and other metals which today are of the utmost importance to industry in general. The Bureau of Ordnance paid for many of these experiments, allowing great laboratories to be supported, thus permitting this most important work to be carried on to the highest degree of success.

As a result of continued experiment in the production of high-grade steels suitable for Navy purposes, an impetus was given to this industry which has carried it along until it stands at the head of the steel industry of the world. Not only does the American steel industry produce steel of the highest grade for every purpose, but it may be said to be the final arbiter in the matter of production and cost.

In the latter half of the nineteenth century Sir Joseph Whitworth of England invented a hydraulic forging press. Unsuccessful attempts were made to obtain the use of his patents in this country. An accurate description of the press could not be obtained and strangers were not permitted to visit the Whitworth shops, nor would Sir Joseph make a press for use in this country. In 1883 the Navy Department sent to Europe a gun foundry board, of which Lieut. William Jaques was secretary, for the purpose of visiting iron and steel plants. Arriving in England, the board, after considerable difficulty, was permitted to visit the Whitworth shops, and Lieutenant Jaques obtained from Sir Joseph a contract giving Jaques, personally, authority

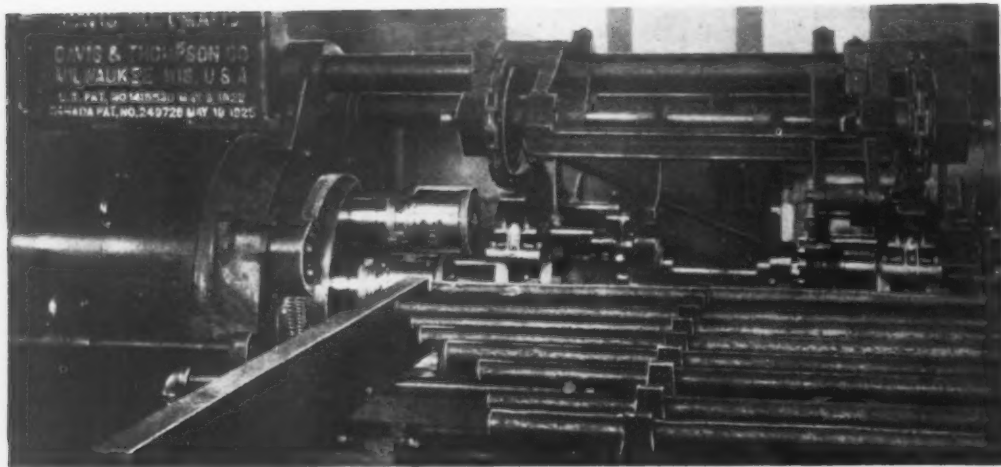
ration. The variety of its products for commercial use is too well known to require enumeration.

A short time after the first armor contract was placed Commander Folger, then Chief of the Bureau of Ordnance, visited Bethlehem and persuaded the company to undertake the manufacture of gun forgings much longer than any that had been made previously. For several years forgings for tubes for 6-in., 8-in. and 10-in. guns had been purchased in England. The first large caliber guns made entirely of American steel were those for the battleships *Indiana*, *Massachusetts* and *Oregon*, manufacture being started in the early nineties.

The quality of forged steel produced by armor plants has steadily risen under pressure of more exacting ordnance specifications from an elastic limit of about 35,000 lb. in 1887 to the homogeneous nickel-steel gun forgings of today, which are treated to obtain 60,000 lb. elastic limit, even in the largest forgings.

For many years forged steel used for certain ordnance purposes was required to have great strength and maximum ductility. As the forging grew in size, cost of production mounted. In the effort to combine safety and efficiency with economy, the Bureau of Ordnance experimented in the use of steel castings to sup-

(Concluded on page 964)



The Pipe Is Picked Up, Gripped, Threaded and Discharged From the Machine Automatically. View at the left is of the head end showing pipe being advanced to a stop in line with die heads

Pipe Threaded Automatically

Conveyor from Cooling Rack a Feature of New Machine for Pipe Mill Work

High output in the threading of pipe is claimed for the machine here shown, which has been developed by the Davis & Thompson Co., Milwaukee, for pipe mill work. The capacity is for threading and reaming random lengths of pipe ranging in size from $\frac{3}{4}$ to 2 in., threading one end at a time.

Only one pair of the machines is required for each furnace. The pipe is picked up, gripped, threaded and discharged from the machine automatically, and the machine is designed so that it may be connected with a conveyor leading from the cooling station. The use of the conveyor is stressed as eliminating handling by cranes and as conserving floor space and labor.

The rate of production is said to be limited for the most part only by the endurance of the die chasers. With the chasers operating at a cutting speed of about 40 ft. per min., $\frac{3}{4}$ -in. pipe is threaded at the rate of 40 pieces per min. It is claimed that in some cases $\frac{3}{4}$ -in. pipe has been threaded at the rate of 63 pieces per min.

The machine is being marketed by William K. Stamets, Pittsburgh. It is called the Rotomatic, and in general design is similar to other Davis machines of the rotating type. One of the previous units, a double-end machine for threading conduit, was described in THE IRON AGE of June 26, 1924. The headstock is a single casting and houses all rotating members, which are fully inclosed and automatically lubricated. The gears and spindles are of steel and heat treated. The drive is through a variable-speed motor mounted on

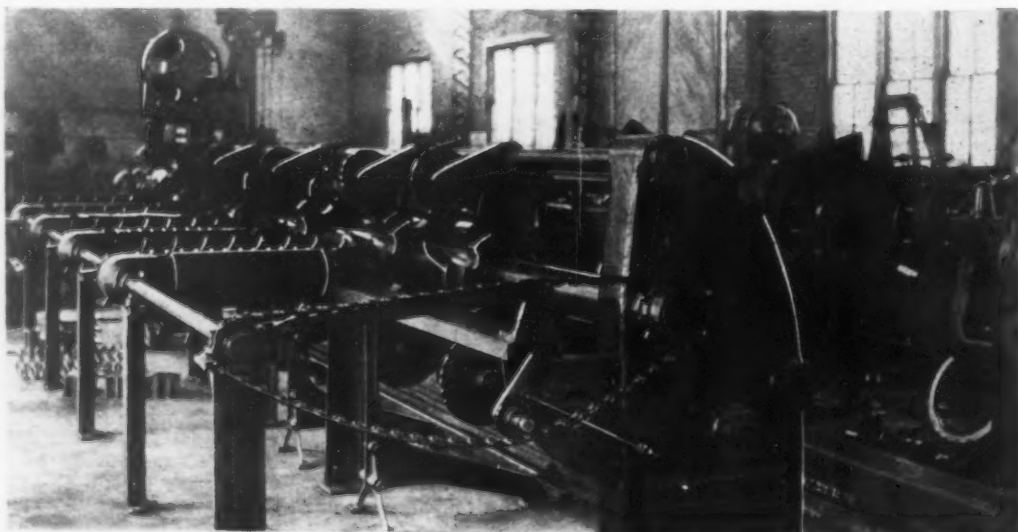
the headstock and belt connected to the driving pulley, an idler providing proper belt tension. If direct current is not available a constant-speed motor may be used, in which case change gears are furnished to provide a variety of speeds.

There are six spindles, the longitudinal movement of which is controlled by floating and positive cams. Die heads screw on the spindles and are quickly removable. The die closing mechanism is automatic. The dies are provided with ample lubrication by means of a motor-driven pump located in the base of the machine and having capacity of 20 gal. per min.

A six-station work drum rotates in synchronism with the spindle drum. The automatic conveyor furnished with the machine takes the pipe from the table, carrying it over power-driven rolls which advance it to a stop in line with the dies and delivers it to the loading station fingers, thence to the chuck jaws. The pipe is then gripped automatically by use of the Davis patented chain clamp which grips the pipe securely during the threading operation, releasing it at the proper time so that the pipe is discharged on the opposite side of the machine. The conveyor from the table to the machine is timed so that it will handle the full range of pipe— $\frac{1}{2}$ -in. to 2-in., inclusive, random lengths up to 22 ft., without adjustment.

The Davis die employed has been given thorough tests in pipe mill practice. It is internally tripped and may be set for any desired number of threads on the pipe and the setting maintained. The dies may be adjusted conveniently for size without removing the die heads from the spindle, and after setting hold to size. There are no small intricate parts in the die head and all parts are hardened and ground. A reamer may be used in connection with the dies so that the pipe can be reamed during the threading operation.

The Machine Is Equipped With Power Driven Conveyor for Advancing Pipe to a Stop. The spider castings at this end do not have gripping jaws at the loading station, thus permitting the handling of crooked pipe



New Hob and Cutter Grinder

Rigid Construction and Operating Conveniences Are Features—Motor Mounted in the Column

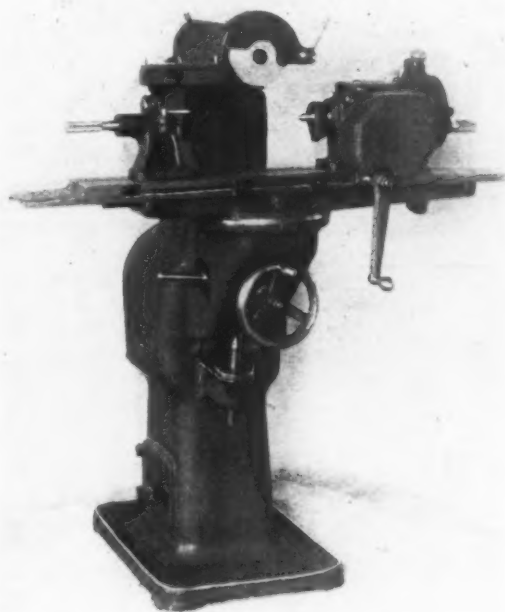
The Pratt & Whitney Co., Hartford, division of the Niles-Bement-Pond Co., New York, is bringing out a hob and cutter grinder for general use in sharpening gear and thread hobs, form milling cutters and, in particular, the company's Curvex cutters. It may be employed for sharpening any cutter which must be ground in the flutes.

Smooth drive is a feature. The machine is motor driven, the motor being mounted inside the column on a hinged platform and belted to a pulley on the wheel spindle. The hinged platform is provided with screw adjustment for regulating belt tension. For ordinary sizes of cutters a $\frac{3}{4}$ -hp. motor with a $1\frac{1}{4}$ -in. belt is used, but in sharpening cutters of large diameter with deep gashes, a 1-hp. motor with 2-in. belt is recommended. In addition to smooth drive to the spindle, advantages claimed for the motor drive arrangement employed are that the motor is free from dust and dirt,

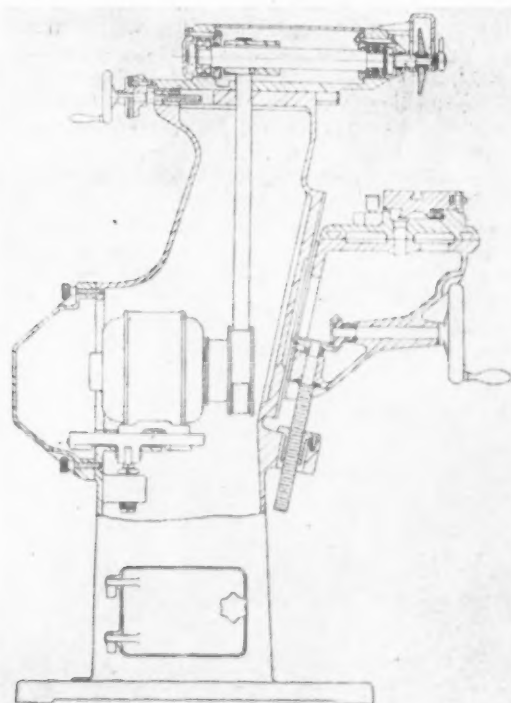
When it is desired to true the wheel it is necessary only to raise the wheel guard and swing the truing bracket down into position, where it is held in exact location by a pin. A regular truing diamond bar is used, and pins on the truing slide provide locating points for obtaining the exact angle on the wheel. The truing slide may be rotated through a short arc to obtain exact setting by means of the setting gage provided with the machine.

The knee is mounted on a dove-tailed slide on the front of the column. This slide is at an angle of 12 deg. from a true vertical position in order to correspond exactly with the cone angle of the wheel. Elevation of the knee is controlled by a screw operated by a large handwheel in front which is connected through a pair of bevel gears. A binder is provided for holding the knee in position. The table is arranged to pivot on top of the knee so that it may be swung to any angle with the wheel spindle in order to compensate for the helix angle of the cutter being ground. A rack and pinion driven by a hand lever traverses the table longitudinally, and stops are provided to control exactly the table movement.

The tailstock, which is mounted in a T-slot on the



Grinder for Sharpening Hobs, Form Milling and Curvex Cutters. The drive arrangement, pictured at the right, is a feature



while at the same time it is well ventilated. It is low enough to avoid vibration.

The column of the machine is a single casting. It carries the knee on a slide on the front and has a machined surface on top for mounting the wheel slide. The wheel head is mounted on the top of the column casting, and is dove-tailed and gibbed in place. A hand wheel on the rear of the slide permits traversing the wheel in or out from the column in order to locate it exactly with the flutes of the cutter. A graduated dial is provided on this hand wheel to facilitate accurate setting.

The wheel spindle is mounted on ball bearings and has means of adjustment for end thrust. All bearings are protected from grinding dust by felt washers. The grinding wheel used is a Norton silicate wheel, grain 3836, grade 1. It is trued to an angle which enables it to clear itself when grinding in a spiral fluted cutter.

The wheel-truing device incorporated takes the form of a swinging bracket mounted on the side of the column, this bracket being arranged so that it may be swung out of the way while the machine is being used.

table, is of simple rigid construction in order to eliminate vibration. The tailstock spindle is heavy and is held securely in position by a binder.

The pinion which meshes with the table rack also meshes with the gearing within the index head, providing the necessary rotary motion of the work when grinding spiral flutes. A system of change gears provides for leads varying from 3 in. to $133\frac{1}{3}$ in. Movement is taken from the change gears to the spindle through a pair of bevel gears, and a large helical spring is provided to eliminate backlash in the mechanism. Rotating a small knob on top of the index head causes rotation of the head spindle through a small arc sufficient to pick up a flute with the grinding wheel. For grinding straight flutes, a lock pin is provided on the rear of the index head by means of which the entire spindle may be locked in position. When grinding straight flutes it is necessary to take out the change gears. A driving dog is provided on the spindle nose.

Indexing is accomplished by index plates on the rear of the indexing head. This indexing is accomplished by varying numbers of holes in these plates in a man-

ner similar to that used on a universal milling machine head.

Ordinarily the machine is used as a dry grinder, but it may be arranged for wet grinding by adding a water tank to the side of the column and equipping the machine with a pump, water guards and the necessary troughs for returning the water to the tank.

The new grinder occupies a floor space 58 in. x 40 in. and is 51 in. high. With regular equipment it weighs approximately 1200 lb.

Bronze-Bushed Holes Burnished on Production Basis

A burnishing machine for burnishing to micrometer size and smoothness bronze-bushed holes in steering knuckles and other parts of automobiles and other products has been placed on the market by the Defiance Machine Works, Defiance, Ohio. This machine is of substantial construction, being designed to withstand the strain and heavy duty of intensive production work. The rated production is 60 to 75 holes an hour.

The main spindle is 1½ in. in diameter, 2¼ in. at the nose and has a No. 3 Morse taper hole in the end. The spindle speed is 290 r.p.m., the spindle feed 54 in. per min. and the maximum spindle travel is 18 in., but this can be reduced to any length by setting adjustable stops provided for that purpose. The distance from the center of the spindle to the face of the column is 8½ in. The machine can be arranged for single-pulley drive from the rear, or it can be direct-connected to a 3-hp. motor.

The carriage which supports the spindle on the vertical slide is actuated by a worm wheel and gear driven with splined shaft by a right- and left-hand friction controlled by a hand lever within reach of the operator while in working position in front of the machine. The feed can be adjusted for continuous motion of the spindle and saddle up and down, or it can be set to make one complete cycle downward, returning up again

and stopping until the frictions are again engaged by the operator for the next cycle.

The lubricant tank regularly supplied is 7 in. wide, 16 in. long and 10 in. deep, inside dimensions. This is mounted on the lower saddle on the front of the machine and has a vertical movement of 6 in., being raised and lowered by means of an air cylinder which can be operated with an air pressure of from 60 to 100 lb. Holding fixtures, made to suit requirements, can be clamped in a stationary position on the main slide on the front of the machine, leaving the work in the clear while the lubricant tank is dropped to its lowest position. When the tank is raised the work to be burnished is immersed in the lubricant while the burnishing operation is being performed. The weight of the machine is 4250 lb. net, and the floor space occupied is 32 in. x 68 in.

Heavy-Duty Semi-Automatic Production Lathe

A semi-automatic production lathe equipped with length and diameter gages has been added to the line of the Sebastian Lathe Co., Cincinnati. This machine, designated as the type B, Gold Seal, is available in

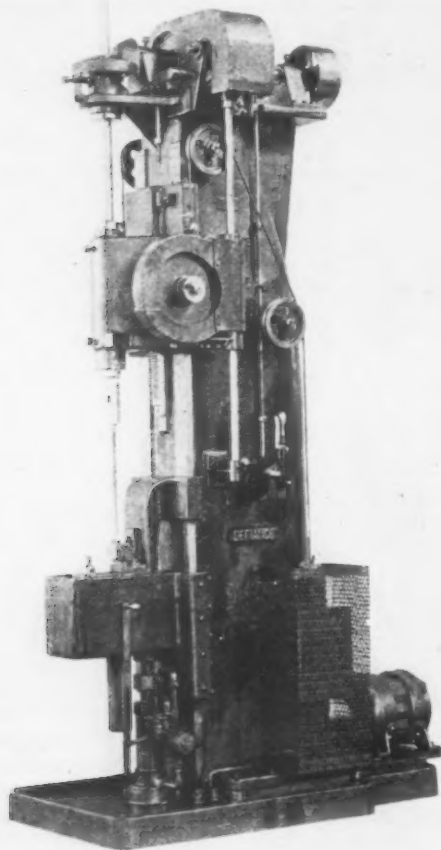


The Cross Feed and Length Feeds Are Fitted With Gages to Facilitate Machining of Spindles and Other Work

15-, 18- and 20-in. sizes, and is intended for the production of multiple pieces at low cost.

The end view of the machine herewith shows both the cross and length feeds fitted with gages notched for the machining of a spindle. Each diameter and length is numbered on the gages and the operator takes them in numerical order. The length gage is a cold-rolled bar with suitably placed notches for locating the shoulders, and the cross feed gages are two notched wheels for controlling the different diameters produced by the turret tool post in the front and rear tool block. It is stated that with this arrangement the accuracy of an engine lathe is provided and at the same time duplicate pieces are produced to close limits without the use of calipers, gages and micrometers. In using the length and diameter gages one piece of the work is completed and then the bar and wheel are notched out to conform to the finished sizes of the piece; this constituting all the setting-up that is required.

The length gage for controlling shoulders on the work is mounted in a bracket secured to the lathe bed. Through a bearing in this bracket there slides a round bar secured to the lathe carriage. A slot milled in the top of this bar receives the notched cold-rolled bar. The latter drops into the slot and is held against



Bronze Bushed Holes in Steering Knuckles and Other Parts Are Burnished Rapidly to Micrometer Size

longitudinal movement by a slot in the underside of a transverse pin in the slot in the round bar. After a job has been set up, the shoulders are located by nicking the work with the rear tool block, with the tool located through placing the dog successively in each of the notches in the bar.

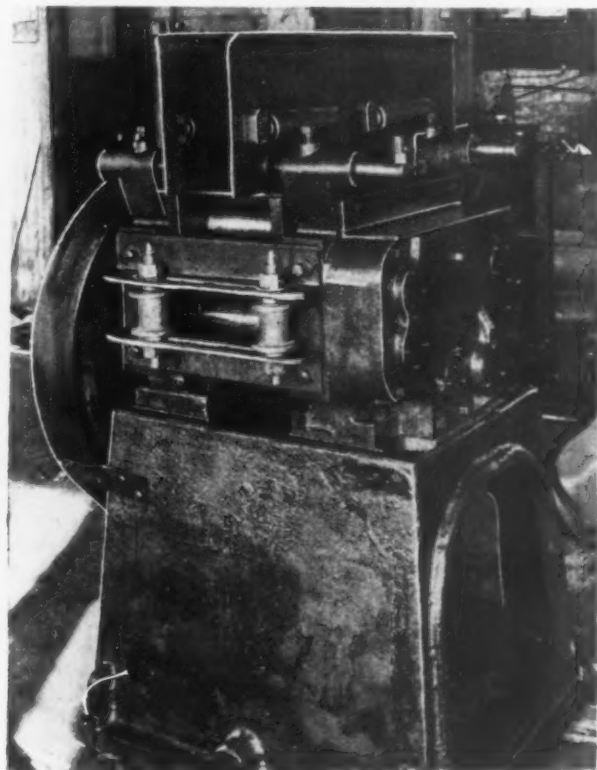
The diameter gages are secured to the cross-feed screw. These disks are notched to receive two dogs, and the notches are arranged so that if the tools are fed up to the work by the cross-feed, they continue to cut until the dog drops into the proper numbered notch controlling the feed of the front or rear cross-slide, as the case may be. This determines the proper diameter. The disks are of such a diameter that a cross-movement of 0.001 in. for the cross feed corresponds to 1/16 in. on the circumference of the disks.

When the cross-feed gages are not being used, a pair of graduated collars for controlling the front and rear tools is placed on the screw. The machine can be furnished with feed rod and quick changed feed box without lead screw if desired.

Machine for Straightening and Coiling Cold Rolled Strip

Rigid mill type construction is an outstanding feature of a combination straightening and coiling machine for cold rolled strip steel, which has been brought out recently by the Dailey Machine Construction Co., Cleveland.

The machine is available with rolls ranging from 4½ in. in diameter and 12-in. face up to 6 in. in diam-



Strip Steel Up to ¼ In. Thick May Be Straightened and Coiled. Rolls may be removed conveniently

eter and 30-in. face. The rolls are of hardened steel or of chilled iron fused on steel shafts by a special fusing process. They may be removed conveniently by removing the housing caps. The guides in front of the entering rolls are rigidly supported. The machine has heavy steel self-contained side guards that are carried direct on the housing caps and are removable with the caps. The bearings are large and of bronze.

The rolls, including the carrier rolls, are gear driven. The gear box is self-contained, oil tight, and cast integral with the roll housings. If the machine is to be used only for straightening, the two pinch rolls may

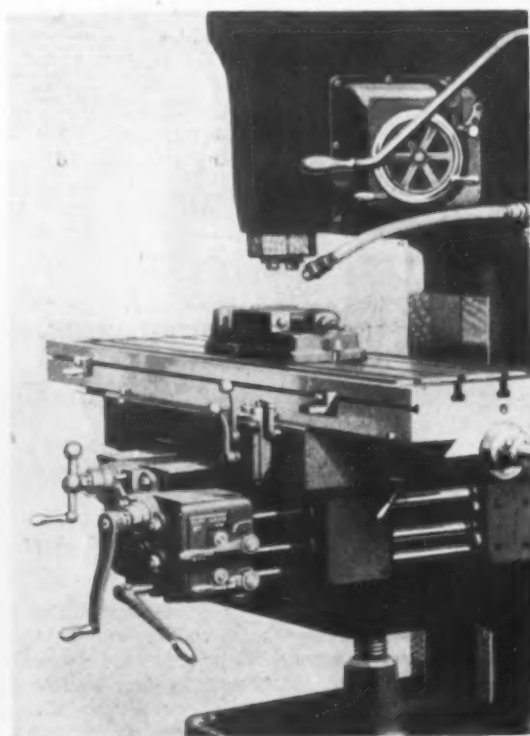
be changed to straightening rolls by setting the upper pinch roll back a short distance toward the three bending rolls.

The capacity of the machine is for coiling material up to ¼ in. in thickness in the large size and for fine gage material up to ⅛ in. in thickness in the smaller sizes.

The Dailey company is offering a line of straightening machines of the same general design in full range of sizes with nine to eleven rolls and with rolls 2½ up to 6 in. in diameter and with 12 up to 30-in. face.

Vertical Miller with Adjustable Spindle

The Kempsmith Mfg. Co., Milwaukee, is placing on the market a vertical Maximillier milling machine with an adjustable spindle. This machine, illustrated herewith, is intended primarily for die sinking, tool making, jig boring and other work requiring accurate and sensitive adjustment of the spindle. All features of the



The Adjustable Spindle Adapts the Miller for Die Sinking, Tool Making and Other Work Requiring Accurate Adjustment of Spindle

company's standard machine have been retained, except the fixed spindle.

The drive is through spiral bevel gears and heringbone gears on the spindle. The spindle is mounted in an octagon quill, which is provided with two large bronze bearings. Because of the large area of bearing, no gibs are used. The upper end of the spindle has ten splines. This machine is built in two sizes, designated as No. 2 and No. 4, and the vertical adjustment for either machine is 6 in.

The spindle speeds are the same as on the company's standard Maximillier, but when specified, spindle speeds two and a half times the standard can be provided, together with ball-bearing spindle. Power feeds to the spindle are three in number, 0.005, 0.009 and 0.14 in. per revolution of spindle, the feed being through a screw driven by a worm and worm wheel. The feed is reversible and has a safety device to prevent overtravel. Two rates of hand feed are also provided, 0.025 in. and 0.125 in. per turn of the hand wheel, these feed changes being made by means of a knob in the center of the hand wheel. All controls are convenient to the operator's right hand.

The net weight of the No. 2 machine is 6800 lb. and of the No. 4 machine, 9800 lb.

Ten-Spindle Dial-Feed Tapper

Holes Tapped at One Passing Through Machine
—Output 1200 Pieces an Hour

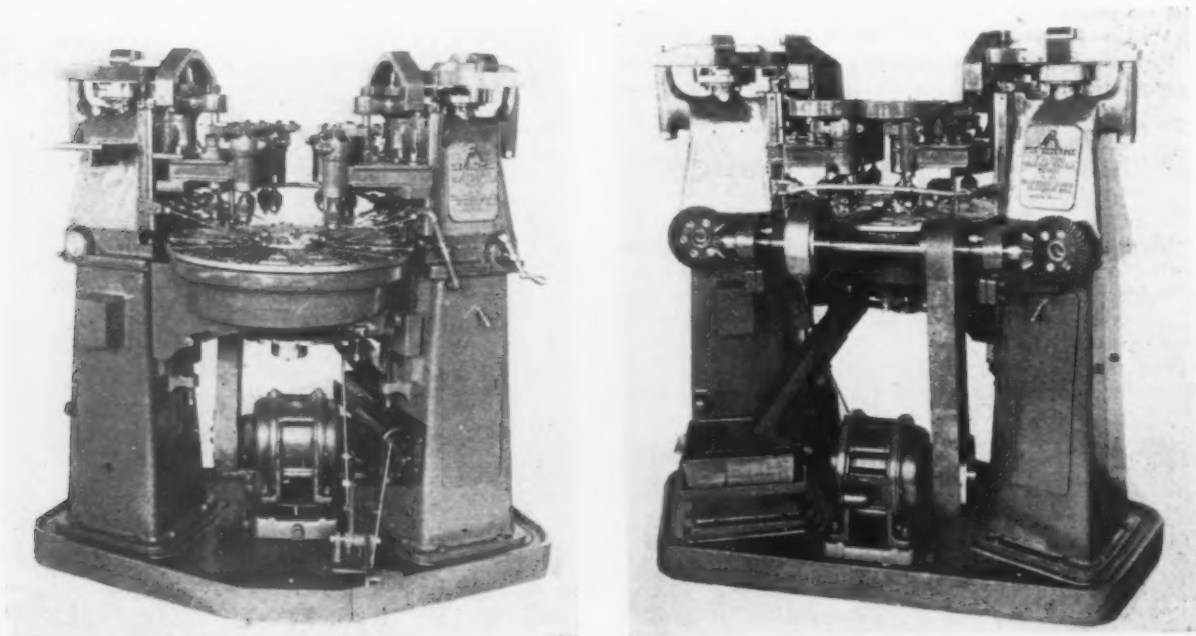
The tapping of ten holes in one piece, at one passing through the machine, is the function of the multiple-spindle dial-feed tapping machine here shown, which has been brought out by the Anderson Die Machine Co., Bridgeport, Conn.

One of the company's previous machines of this type, having five spindles and equipped with a 10-in. dial, was described in *THE IRON AGE* of Jan. 26, 1922. It was there noted that the machine does not employ

counter-boring, reaming or tapping, can be furnished by the company.

The timing of the machine is controlled by the crank which operates the segment, the cam which raises and lowers the head containing the spindles, and the cams that operate the indexing and locking device of the dial. All of these elements are mounted on one shaft which runs vertically through the center of each of the two units making up the machine. These elements are provided with adjustment so that the two units can be timed accurately, and after being secured in position these cannot change in relation, the timing therefore remaining constant.

The machine illustrated is tooled to tap in one operation the ten holes in a sheet metal part which is



Dial Feed Tapper With Ten Spindles. The machine is made up of two five-spindle units driven from the horizontal shaft shown in rear view at right

clutches in connection with the operation of the spindles, a toothed segment which meshes into a train of gears being used instead. This segment is oscillated by means of an adjustable crank, giving a slow rotation to the tapping spindles in a clockwise direction and a relatively rapid counter-clockwise rotation for withdrawing the tap from the work.

The ten-spindle unit illustrated is made up of two of these five-spindle machines mounted on one base. The two units are operated in synchronism by means of a horizontal shaft at the rear of the machine. Bevel pinions at each end of this shaft mesh with gears on the worm shaft which forms the main drive for each unit. The shaft is driven by a 1½-hp. motor, as shown, various changes of speed being obtained by using pulleys of various sizes.

The dial is indexed by means of a cam through a connecting rod which oscillates a yoke and pawl, these operating a ratchet. The dial is locked in position by means of a locking bolt controlled by a cam which is timed so that the ratchet is locked in position during that portion of the cycle in which the tapping is done. The ratchet is mounted on a vertical shaft which rotates vertically through a hub extending through the center of the pan under the dial. At the upper end of the shaft there is a flange to which the dial is secured. This arrangement is stressed as eliminating the necessity of providing teeth in the dial itself for the purpose of indexing. This design is said to reduce the cost of making dials and to make it possible to present more than one piece to the tapping spindles for each index position. The standard machine is provided with index ratchet having 18 teeth. The dial is indexed in a counter-clockwise direction, it being stated that feeding can be more readily accomplished in that way. Dials for various operations, drilling, counter-sinking,

approximately 8 in. long by 2 in. wide. In this set up the machine is timed to give about 20 strokes per minute, making it possible to tap 1200 pieces per hour, or 12,000 holes tapped.

Dials can be made for feeding parts of widely varying shape. It is also possible, by substituting a gear for the segment, to use one of the units for drilling and countersinking, five spindles being available for this purpose without affecting the other portion of the machine as used for tapping the holes drilled by the first section.

Device for Winding Small Springs

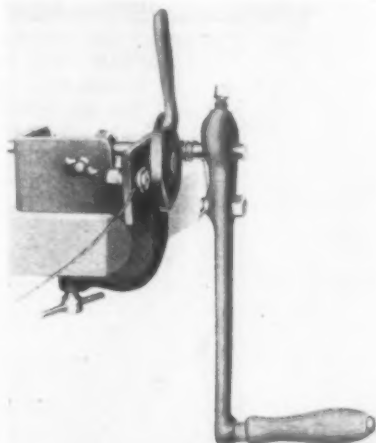
A device called the Rapid spring winder, and intended for use in making springs ranging in size from ½ in. to 1¼ in., inside diameter, has been placed on the market by the Fostoria Screw Co., Fostoria, Ohio. The size of wire from which the springs may be made ranges from the smallest up to 3/16 in.

The construction of the device is simple, it being made up of several cast-iron parts and a steel mandrel upon which the spring is wound. The latter fits into two notches in the main casting and is held in place by a tension collar. A handle is attached to the end of the mandrel as shown. The diameter of the spring is determined by the mandrel used, nine sizes of which are available, and the pitch or lead of the spring is governed by the position of the cam shown at the left of the winding handle.

To wind a spring the wire is threaded through a tension nut and carried between the cam and the side of the frame casting. It is then carried over, or under, the mandrel and around the tension nut in the handle, where it is inserted through a hole provided. The tension nut at the front of the winder is tightened to hold

the wire taut as the handle is turned in winding the spring. The cam is then loosened and set with its edge close against the side of the mandrel, the cam being turned to that point where the thickness will give the desired pitch to the spring. The handle of the device is then turned until the spring is wound to the desired length, after which the wire is scored with a file at

Springs Are Wound on a Mandrel, the Nine Sizes of Which Produce Springs Ranging From $\frac{1}{8}$ to $1\frac{1}{2}$ In. in Diameter. The pitch or lead is determined by the adjustment of the cam

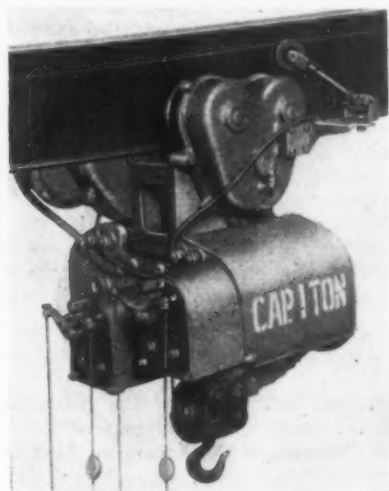


the point at which it is to be cut. A quick jerk of the handle causes the wire to snap at the point scored.

An expansion spring is wound with the cam thrown forward, while compression springs are made by turning the cam back to give the desired pitch or distance between the coils. The coils can be made either right- or left-hand by changing the direction of the wire on the mandrel. A special handle is available for use with small mandrels.

Small Electric Hoists with Motor-Driven Trolleys

A new motor-driven trolley has been developed by the American Engineering Co., Philadelphia, for use with its $\frac{1}{2}$ -ton and 1-ton class A, Lo-Hed electric hoists, which have been built, heretofore, in bolt suspension and plain trolley types only. The trolley and hoist are offered as providing an inexpensive overhead system



Motor Drive Trolley Applied to $\frac{1}{2}$ and 1-Ton Electric Hoists. The travel speeds provided are 80 or 120 ft. per min. The head room required is 22 inches

for handling loads of 1 ton or less at high speed, both in lifting and moving. The accurate control provided is said to permit the hoist to be used economically in spotting work for machine tool operations. The motor trolley can be applied conveniently to class A Lo-Hed hoists now in service.

The trolley can be supplied with travel speeds of 80 or 120 ft. per min. The headroom required for the hoist and trolley is only 22 in. The three main castings, from which the hoist and load are suspended, are of cast steel. The spur gear drive is inclosed and runs in an oil bath. Hyatt roller bearings are used on all

shafts, and the motor, which is also inclosed, is equipped with ball bearings. All parts are accessible and the motor can be removed conveniently. The hoist may be arranged for remote control, if desired.

Machine Arranged to Drive Rivets from Below

A riveting machine arranged to permit inserting of rivets from above and driving them from below, is shown in the accompanying illustration. This arrangement, together with the rapidity of operation, 50 strokes per min., is stressed by the builders, the Hanna Engineering Works, 1765 Elston Avenue, Chicago, as having made possible some unusual riveting records with this equipment.

The machine is available in sizes capable of driving $\frac{1}{4}$ -in. to $\frac{1}{2}$ -in. rivets hot, or $3/16$ -in. to $3/8$ -in. rivets cold. It can be used also for punching. The mechanism is a combination of simple lever and toggle which combine a long die stroke with a wide range of uniform pressure, thus eliminating the necessity of screw adjustment on the die. The die approaches the work rapidly, the speed gradually decreasing until the die enters the uniform-pressure area of the stroke. The



Rivets Are Inserted From Above and Driven From Below. The machine operates at 50 strokes per min.

advantage claimed for this die stroke is that it provides the greatest speed where the work is lightest; as the rivet head forms, the pressure increases, reaches a maximum and maintains it for several inches of piston travel. Ordinary variations in rivet lengths and plate thicknesses are taken care of automatically by the wide range of uniform pressure provided.

Multiple Shearing of Sheet and Tinplate Bars

To secure greatly increased output with a minimum of handling labor, DeBergue & Co., Ltd., Strangeways Iron Works, Manchester, England, are putting out a new multiple shearing machine. This was described and well illustrated in *Engineer* of Jan. 22. The equipment includes the shearing machine, a conveyor for removing the cut bars, an electric overhead traveling crane and a grab for handling the bar skips.

The machine illustrated has eight pairs of shear blades, is double geared and has a heavy flywheel. It is driven by a d.c. motor of 40 to 66 hp., depending upon the speed. Movement of the shearing slide is

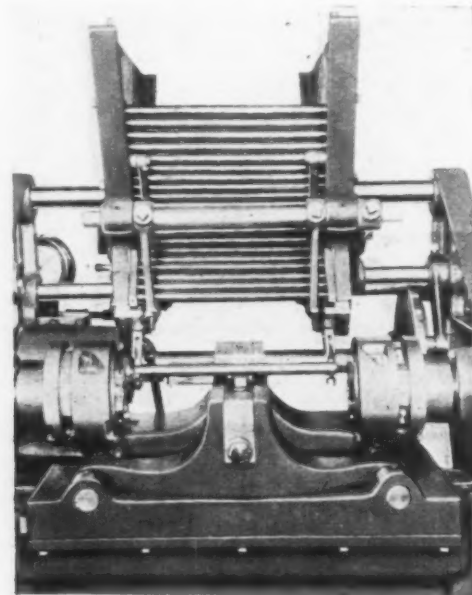
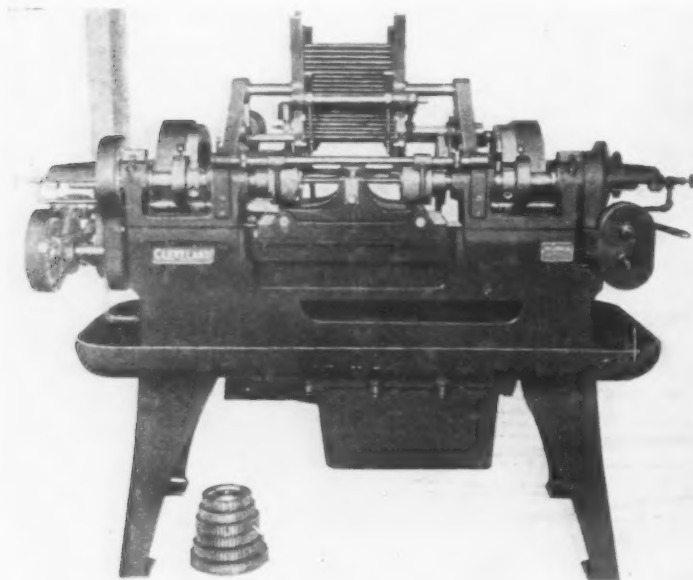
controlled by a treadle-operated clutch stop motion. The shears are adjustable from 23½ to 41 in. length of product, the pinions on all the shear saddles being driven simultaneously from a jackshaft. Adjustment of the shear blade spacing from the stop through the succession of blades, to obtain equal spacing, is secured by using gearing of progressively increasing ratio on the successive saddles.

Automatic Machine for Double-End Threading and Other Work

Economies in the threading of pipe nipples and studs; milling the bearing diameters on both ends of shafts; double-end drilling and chamfering, the ends being machined simultaneously, are claimed for a new

cated at the center, as shown, which is arranged with oscillating levers timed from the cam shaft. These levers control the dropping of the parts to the sliding conveyor fingers, which carry each piece to the air-operated floating center chuck. A mechanically operated chuck can be furnished if desired.

The drive of the machine may be by means of single pulley and belt, or by motor. Starting and stopping may be controlled conveniently by the hand lever at the left of the machine, which operates a clutch in the driving pulley. Engaging and disengaging the tool feed is accomplished by the hand lever at the extreme right. The machine may be turned over by hand by placing a crank, furnished with the machine, on the shaft to the left of the tool-feed hand control lever. The company's safety shearing pin device, which shears off the pin and stops the feed, is incorporated in the machine to prevent damage to any part of the machine or tools in



The Front View Above Shows the Nipple Blank In the Chuck and the Die Heads Advancing. The close-up view at right illustrates the use of the conveyor fingers in delivering the nipple blank to the chuck

double-end machine which is being added to the line of the Cleveland Automatic Machine Co., Cleveland. Ease of operation and the possibilities in reducing two operations or more to one, at a lower labor cost, are features stressed by the makers.

Two sizes of the machine, which is designated as the model J, are available. The smaller unit is for threading nipples up to ¾ in. pipe size, and studs up to ¾ in. in diameter, in lengths from 1½ to 12 in. The larger machine has capacity for pipe nipples up to 2 in. and studs up to 1½ in. in diameter, in lengths from 1½ to 14 in.

In this machine the tools rotate and are carried to the work, which is held in a stationary center chuck. The machine is equipped with a hopper magazine lo-

case of accidental jamming of the latter. This pin is arranged so that it may be quickly replaced.

Cams mounted on the circumferences of two cam drums on a shaft at the rear of the machine furnish the tool feed to the two tool spindles. Cams on the side of one of tool feed drums provide the action for operating the finger conveyors in the magazine. A disk on the cam shaft operates the lever controlling the feed of parts to the conveyor fingers. One of the cam drums also serves to rotate the air cylinder, opening and closing the floating center chuck.

Oil is carried through the tool spindles and self-opening dies in a constant stream, which clears away the chips and lubricates the chasers. Change gears provided permit four changes of spindle speeds.

To Ascertain Grades Needed of Billets for Concrete Bars

WASHINGTON, March 30.—The committee appointed at a conference on Jan. 26 to conduct an investigation, from the standpoint of production and use, to determine what grade or grades of new billet concrete reinforcing steel bars to adopt organized here last Thursday when

it met with W. C. Wetherill, director of the National Committee on Metals Utilization, Department of Commerce. A. E. Lindau, Chicago, of the American System of Concrete Reinforcing, was made chairman. The committee decided upon two sets of questionnaires, one to be sent to producers and the other to users. The full committee was in attendance except representatives of the American Association of State Highways and the American Institute of Architects.

The schedule of the next installments of the Business Analysis and Forecast, by Dr. Lewis H. Haney, Director, New York University Bureau of Business Research, is as follows: April 8—Status of Steel Consumer Demand; April 15—Position of Iron and Steel Producers; April 22—General Business Outlook.

In This Issue

Price of steel bars has declined considerably since 1913 in comparison with most other commodities.—Average purchasing price today, estimated in buying power of 22 commodities, is not three-fourths of its pre-war value.—Page 925.

Hawthorne Works, Western Electric Co., abolishes all-around toolmakers and splits up duties.—Special men now employed for planning, designing, ordering and actual manufacturing of tools.—Page 935.

Casting of 3-ton stern piece for U. S. cruiser "Chicago" in Midvale plant, 1887, marked real beginning of cast-steel industry in America.—First armor plate made here, in same year by Bethlehem Iron Co., through use of English and French patents.—Page 913.

Unusually large, heavy castings lowered into pit for easier machining.—Travelling head planer then moved forward until work is reached; same method used with drills.—Page 899.

New etching reagent develops microstructure of aluminum alloys more satisfactorily.—Mixture of nitric and hydrofluoric acids in glycerine also differentiates between compounds at same time.—Page 903.

Special attention given to lighting in new plant of G. A. Gray Co., Cincinnati.—Entire north wall of plant is an unbroken expanse of glass 22 ft. high.—Page 909.

Possible total market for metal lath may be as large as 750,000 tons annually.—Expansion of sales merely waiting for public's education, says Philip Graff.—Page 930.

Total net earnings of Inland Steel Co. for 1925 largest in several years.—But balance available for common stock was smaller than for two preceding years.—Page 965.

English builders admit steel houses can be built cheaper than wood.—Provided appearance and comfort are not stressed too heavily; development of metal for homes here based on improvement in usefulness, beauty and wearing qualities rather than on cheapness.—Page 936.

Steel Corporation's proportion of total steel ingot production has been decreasing since 1921.—Made 42.8 per cent of total in 1925; present capacity in terms of steel products for sale about 16,900,000 tons.—Page 936.

Use of steel scrap for last two years must have been close to 15,000,000 tons annually.—Only 63.9 tons of Bessemer and basic pig iron made last year for every 100 tons of steel ingots and castings.—Page 937.

Possible that sheet mill workers will demand wage increase after April 6 meeting.—American Sheet & Tin Plate Co. has already worked out new wage plan embodying definite relation between rates for skilled and unskilled labor.—Page 934.

Less washing and pickling needed in new method of annealing wire in salt bath, is claim.—Direct costs of process said to be no greater, indirect savings considerable.—Page 928.

Time lost on account of sickness in average industrial plant runs from 5 to 15 days per man per year.—Workers lose on the average 20 days a year through involuntary unemployment.—Page 963.

Hardness of cold-rolled copper bars over the cross-section found to be uniform for reductions in thickness per pass above 20 per cent.—Top surface harder than side with small reductions, but difference disappears with 10 to 20 per cent reduction.—Page 907.

Machinery exports for February about \$10,000,000 above same month last year.—\$60,000,000 increase for eight months ended February against same period of previous year.—Page 961.

Daily rate of pig iron output for March estimated 6 per cent above February.—3,430,000 tons estimated total production; smallest March in 4 years, but largest daily rate in year.—Page 926.

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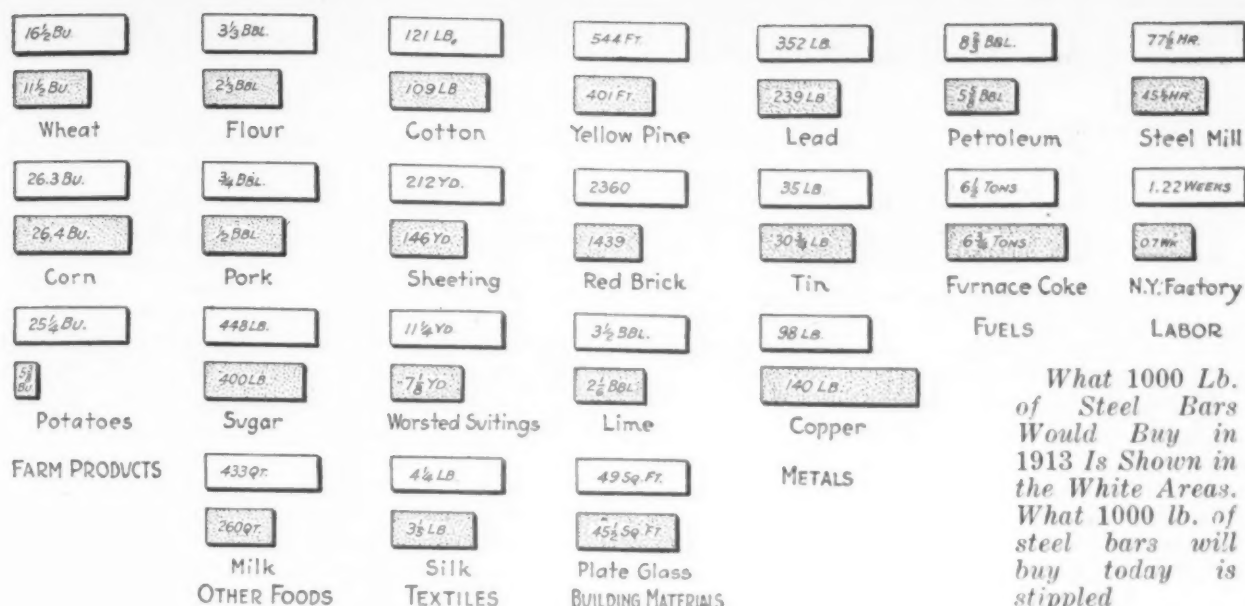
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Discriminating Information

WHEN the stock market boils with selling orders and some commodities start to sag, current reports of business conditions are more likely than usual to be tinged with errors. It is precisely at such a time that the business paper feels its responsibility most keenly and scrutinizes with added care each item in the multitude that make up its market reports. Appreciation of this attitude by the industries served may even find its reflex in circulation figures. Last week THE IRON AGE added more new subscribers than in any similar period this year.

For News Summary See Reverse Side



Steel Bars Will Buy Only Five-Sevenths as Much

Comparison of 1913 Prices with Today's Shows Purchasing Power of Bars Has Declined Heavily

IN 1913 1000 lb. of steel bars would have bought 25 1/4 bu. of potatoes; today the same quantity of bars will purchase only 5 1/2 bu. While this is an extreme case, it is but symptomatic of the change which has taken place all along the line in the great majority of the commodities of modern commerce. In a similar way, it may be shown that the same 1000 lb. of bars will today buy only 260 qt. of milk, against 443 qt. in 1913. They will buy less than 2 1/2 bbl. of flour, against nearly 3 1/2 bbl. 13 years ago.

Of the 22 important commodities listed in our table, and shown graphically in the diagram, only three are today so low that steel bars will buy more of them than in 1913. These are furnace coke, with a change of about 4 per cent; corn, with a change of less than 1/2 per cent; copper, with a change of 40 per cent.

Taking up the commodities in logical order, we find that farm products, consisting of wheat, corn and potatoes, are far better off with regard to prices than are steel bars. Our 1000 lb. of bars in 1913 would buy 16 1/2 bu. of wheat, to only 11 1/2 bu. today. With corn the figure has practically not changed, for 1000 lb. of bars in either case would buy about 26 3/4 bu.

Other food products include flour, sugar, pork and milk. One thousand pounds of steel bars in 1913 would buy 448 lb. of sugar; today, only 400 lb. In the earlier year the bars would buy 0.74 of a barrel of pork, against 0.54 bbl. today.

Textile items include cotton, sheeting, worsted suitings and silk. One thousand pounds of steel bars, 13 years ago, would buy 121 lb. of cotton, against less than 110 lb. today; they would buy 212 yd. of cotton sheeting in 1913, against only 146 yd. today, and so on.

Building materials show the same characteristics as the other items, as indicated in the table.

Of fuels furnace coke and Pennsylvania petroleum are covered. Our 1000 lb. of bars in 1913 would buy 6.43 net tons of furnace coke; today the amount is 6.7 tons. With petroleum, however, the change is in the other direction, for the earlier amount purchasable with bars was 8 2/3 bbl. against 5 1/3 bbl. now.

Among the non-ferrous metals, copper, lead and tin are prominent. The two last are higher proportionally than 13 years ago. Copper is so low, however, that 140 lb. may be bought with 1000 lb. of steel bars, against 98 lb. in 1913.

Common labor in steel mills, which commanded 20c. an hour in 1913 and gets 40c. today, represented re-

spectively 77 1/2 hr. for 1000 lb. of bars in 1913 and only 50 hr. now. Factory labor, on a weekly basis in New York State, tells the same story. In 1914 the bars would have bought 1.22 weeks of factory labor, counting the average for all factory workers in the State, against 0.7 week under present conditions.

Without attempting to weigh the ratios in purchasing power of steel bars under the two years, a straight average of that ratio, for the 22 items listed, is 0.722. In other words, the bars today will buy 72.2 per cent as much of the various commodities as was the case before the war. That the steel companies have been able to keep their heads above water in the operations of the past few years has been due almost wholly to drastic cutting in operating costs through improved machinery, more direct routing and other managerial devices designed to cut costs and thus permit dividends. Under the old conditions, few of the companies could have been operated recently without running into heavy deficits and none could have made earnings which, by any stretch of the imagination, could have been termed satisfactory.

Commodity	Unit	Prices		What 1000 Lb. of Bars Would Buy in		Ratio 1926 to 1913
		1913	1926	1913	1926	
Steel bars	1000 lb.	\$15.50	\$20.00	..	..	..
Wheat	Bushel	0.936	1.752	16.55	11.41	0.689
Corn	Bushel	0.589	0.758	26.3	26.4	1.004
Potatoes	Bushel	0.614	3.725	25.24	5.37	0.213
Flour	Barrel	4.62	8.70	3.36	2.3	0.686
Pork	Barrel	20.93	37.00	0.74	0.54	0.73
Sugar	Pound	3.46c.	5.00c.	448	400	0.893
Milk	Quart	3.5	7.7	443	260	0.586
Cotton	Pound	12.84	18.25	120.7	109	0.9
Sheeting	Yard	7.3	13.65	212.3	146.5	0.69
Suitings	Yard	\$1.38	\$2.79	11.23	7.17	0.639
Silk	Pound	2.65	6.25	4.25	3.2	0.753
Yellow Pine	M. ft.	28.50	49.83	544	401	0.737
Red brick	M.	6.56	13.90	2360	1439	0.61
Lime	Barrel	4.43	9.16	3.5	2.184	0.624
Plate glass	Sq. ft.	31.8c.	44.0c.	48.7	45.45	0.933
Lead	Pound	4.40	8.375	352.3	238.8	0.678
Tin	Pound	44.33	65.0	34.96	30.77	0.88
Copper	Pound	15.82	14.25	98	140.3	1.432
Petroleum	Barrel	\$1.79	\$3.55	8.66	5.63	0.651
Furnace coke	Net ton	2.41	3.00	6.43	6.7	1.042
Factory labor	Week	12.70	28.57	1.22	0.7	0.574
Steel labor	Hour	20c.	40c.	77.5	50	0.645
Average ratio	....	..	..	..	..	0.722

Electrotechnical Commission to Meet In New York

Plans to work out a world language for electricity will come before a ten-day plenary convention of the International Electrotechnical Commission to be held in New York, at the Engineering Societies Building, beginning April 13. Dr. Clayton Halsey Sharp is president of the United States committee of the commission.

National committees of the commission in America, Great Britain and the countries of the Continent have been developing studies in this field, and will submit reports at the meeting. Radio expansion, it is declared, has increased the demand for common terms and symbols, and steps have already been taken to meet this situation as a part of the general program of world standards in electrical language. The standardization of electrical machinery and apparatus in the whole electrotechnical field, will be taken up, and the preparation of an international dictionary of electrical terms will be discussed.

Polish Ferromanganese and the Foreign Situation

Some interesting comment on the foreign ferromanganese situation is found in the *Metal Bulletin*, London. The loss of the bulk of American business in ferromanganese has led producers in England, Germany and Norway to unite as far as possible, says the statement, without any hard and fast agreement being made in order to combat competition from fresh sources of supply. The movement has been under consideration for some time and seems now to have been initiated owing mainly to efforts by newly developed Polish units to sell in the Belgian and other markets. "Arrangements between the three groups is, however, indefinite, for although when facing competition from experienced sources they combine against it, they are still subject to the normal competition among themselves. This latter is by no means inconsiderable when it is realized to what extent production preponderates over consumption at the present time."

Canadian Agricultural Implement Trade

WASHINGTON, March 29.—Sales of agricultural implements in Canada during 1925 increased 60 or 75 per cent, and at the same time the export trade showed a considerable expansion, states a report to the Department of Commerce from Assistant Trade Commissioner Thomas R. Wilson, Ottawa. Exports of such implements during the past fiscal year amounted to \$11,342,712, as compared with \$9,399,519 in the fiscal year 1924, and \$6,066,893 in the fiscal year 1923. Imports, however, decreased from \$11,766,285 in the fiscal year 1924 to \$6,494,986 in the fiscal year 1925, of which \$6,270,141 represented purchases from the United States.

Use of Hot Blast Saves Foundry Coke

According to experiments carried through to a practical termination by the Griffin Wheel Co., fully 25 per cent of the yearly expenditure for foundry coke in this country can be saved. Based on an annual foundry melt of 10,000,000 tons, there is now used, say, 1,000,000 tons of coke of which 250,000 tons, or more, apparently is wasted.

Several years ago a cupola was introduced in this country from Germany. This cupola employed the regenerative principle for obtaining a hot blast, and required a reversal of the blast at regular intervals of 10 to 15 min. The Griffin Wheel Co., after experimenting for some time with that type of equipment, abandoned it and designed and applied for patents covering the recuperator principle. Cast iron was selected for the recuperator as gas tight and practicable for blast temperatures up to about 300 deg. Fahr. Experiments have been conducted wherein blast temperatures were

raised to 500 or 600 deg., but 300 deg. seems to give almost as much economy as the higher temperatures.

With a blast temperature approximating 300 deg. experiments show, it is learned, that only 25 per cent of the waste-gas heat is required for a saving of 25 per cent of the coke requirements. Economies resulting from higher temperatures are not in proportion to the temperature of the blast, for it is found that the inherent heat of the blast plays only a comparatively small part in the heat balance, the important item being the economy resulting from improved combustion in the cupola. A hot blast pressure of approximately one-half the amount ordinarily used results in the same cupola capacity, it is stated, as obtained in present practice. The net savings arise from the fuel and power economy and more positive control of melting conditions.

New Aluminum Rolling Mill in Northern New York

The United States Aluminum Co. is constructing a plant in Massena, N. Y., for the manufacture of aluminum alloy rods and bars for structural purposes. The new plant will consist of a melting room, 70 by 160 ft., to be located north of the present wire mill and east of the melting room. Attached to the new melting room will be the new fabricating plant occupying a floor space 150 by 420 ft. The melting room is to be fitted with floors of cast iron plates and electric furnaces will be installed. The rolling mill will be equipped with four mills, two of them 18-in. capacity, one 12-in. and one 10-in. More cabling and wire drawing machines will be installed, to take care of increased demand. The company has recently been turning out about 1,000,000 lb. per month of transmission cable and wire.

Freight on Imported Goods Not Dutiable

WASHINGTON, March 30.—Affirming the judgment of the Board of General Appraisers, the United States Court of Customs Appeals has held that freight is not part of the dutiable value of merchandise. The decision was the outcome of a case brought by the Government against S. C. Lyons. On an appeal from reappraisement proceedings before the board, the Government contended that the freight from the factory to Hamburg, Germany, was part of the market value of the merchandise and should not have been deducted from the invoice price for dutiable value purposes. The merchandise consisted of illuminating glassware and was purchased in Bischofswerda, Saxony.

Steel in Old Madison Square Garden Not Protected

Following the recent demolition of the famous Madison Square Garden in New York, Frank W. Skinner, consulting engineer of that city, made a survey of the condition of the structural steel in the razed building. The report of this survey has been published by the American Institute of Steel Construction in the form of a booklet. Mr. Skinner's investigations show that all of the structural iron and steel, with the exception of a relatively small proportion under special and unusual conditions in the main tower, was in an excellent state of preservation. This is all the more significant because little care had been taken for maintenance. None of the metal had been protected except where it happened to be inclosed in brickwork or floor slabs. There was slight evidence of periodical painting, save in the case of columns and balcony metal.

New members of the Copper & Brass Research Association are the American Metal Co., Ltd., refiner and dealer in metals and chemicals, 61 Broadway, New York, and the Wheeler Condenser & Engineering Co., manufacturer of brass and copper tubing, 149 Broadway, New York.

MARCH IRON OUTPUT

Estimates By Wire Indicate a 6 Per Cent Increase
in Daily Rate Over February and a
Net Gain of 10 Furnaces

Figures gathered by wire from blast furnace companies which made about 92 per cent of the pig iron produced in February indicate that the March output with the last two days estimated was approximately 3,430,000 gross tons. This is about 110,640 tons a day, or 6 per cent larger than the February daily rate of 104,408 tons. This is the largest production rate in 12 months, but it falls short of that of March, last year, and it is also less than that of March of both 1924 and 1923. The estimate for March this year as compared with the same month of the last three years is shown in the following table:

March	Total	Daily Rate
1926.....	3,430,000	110,640
1925.....	3,564,427	114,975
1924.....	3,466,086	111,809
1923.....	3,523,868	113,673

The indications are that there has been a net gain of 10 furnaces during the month, as against only 2 in February, bringing the total active at the end of March to 236. The final figures will be published in THE IRON AGE of April 8.

Germany's Increased Steel Exports in 1925

Exports of iron and steel from Germany were greatly expanded during 1925, when 3,049,082 metric tons was shipped to foreign markets, according to a report to the United States Department of Commerce from Assistant Commercial Attaché Douglas Miller, Berlin. This is a gain of 86 per cent over the 1924 trade and makes exportation more than double the volume of importation.

Imports also gained, but not in such great proportion. In 1925 the receipts of foreign made iron and steel amounted to 1,316,050 tons, whereas for 1925 it had risen to 1,435,036 tons. Many of the finished products were actually imported in less volume, but the fact that receipts of scrap were more than five-fold the scrap imports for 1924 counteracted minor losses in other categories.

On the other hand, exports of scrap iron were much lighter, while foreign shipments of pig iron and ferro-alloys increased correspondingly. Rails and rail accessories; bar iron, hoops and girders; plates and sheets; tubes and fittings; and wire—all these classes showed unusual advances.

Operations Well Sustained in Mahoning Valley

YOUNGSTOWN, March 30.—This week, in the Mahoning Valley, steel ingot production shows a moderate increase, but there is some loss in active rolling mill capacity. The Republic Iron & Steel Co. again placed its 14-16 in. merchant bar mill in action, and also its plate mill, following the altering of it from a 90-in. mill to an 84-in. plate and 60-in. universal mill.

With all Valley independents, there will be a considerable carryover of contract tonnage from the first to the second quarters, as consumers in most cases did not fully specify against contracts the first three months of the year.

This week's schedules show 44 of 53 independent open-hearth furnaces active in the Mahoning Valley, and enlarge ingot output in the Bessemer department; the Republic company has placed its Bessemer plant on a two-turn basis.

Pipe mill schedules show an increase of two mills as compared with last week, with 12 of 18 rolling.

Of 127 sheet mills, 110 are scheduled, against 116 the previous week, a decline by the Trumbull company accounting for the recession. Strip mills are active at 85 per cent and skelp capacity at 80 per cent. Bar mills are running about 75 per cent. Within recent

weeks there has been appreciable letdown in the operation of bar mill capacity, due to some recession in business.

The Youngstown Sheet & Tube Co. reports that its properties are averaging 85 per cent and the Republic company 75 per cent.

Primary steel makers say that considerable more business is coming from the automobile industry than heretofore, and heavy tonnages are being booked for second quarter. Earnings of the Trumbull company the first quarter are reported three time its preferred dividend requirements for the period.

British Safety Razor Blade for America

One of the principal industrial developments in Sheffield, England, during recent years is the manufacture of safety razor blades. Considerable space is devoted to a description of the plant for producing these blades at the Fitzwilliam Works of Darwin & Milner, at Tinsley, near Sheffield, in a recent issue of the *Sheffield Daily Telegraph*. It is stated that the output is a million blades a week of a specially patented type of cobalt steel and that a larger output is in prospect. The present plant occupies an acre and employs not less than 840 girls. This is expected to be increased to 1200 in that particular department alone.

It appears that only one shift of workers is now being used, practically all the production being absorbed by the British market, but an invasion of the American market is contemplated, in which case a double shift will be employed. The mill capacity for cold rolling the razor steel is being doubled and heavier mills are being put in.

The company is reported to have evolved special processes by which it is possible not only to make the articles rustless, as hitherto, but also as completely stainless as the best low-carbon stainless steel products. It is stated further that the company intends to apply cobalt steel to the whole range of cutlery.

Plate Demand at Seattle

SEATTLE, March 26.—A water line is up at Tacoma, Wash., that will take about 1200 tons of plates, on which bids will soon be asked. The city of Spokane is also in the market for 300 tons of plates for water lines extensions. Plates are ruling firm at 2.30c., Seattle, and it would require a very desirable tonnage to shade this price. The local Bell telephone building is to be raised three stories, the steel to be erected by the Hofius Steel & Equipment Co. of Seattle, and the material, 300 tons, to come from the United States Steel Products Co. A new motion picture theater, to be erected on Ninth Avenue, Seattle, is expected to require about 1500 to 2000 tons of steel.

Blue annealed sheets are firm at 3.15c., black sheets at 3.85c. to 4.90c., and galvanized at about 5.10c., delivered Seattle. Local demand for cold finished steel is active at about 3.10c., Seattle. The Pacific Coast Forge Co., the local maker of railroad spikes, continues to quote \$3.25 per 100 lb. for standard sizes, delivered Seattle. The Pacific Coast Steel Co., the local maker of steel bars, is quoting about 2.75c., Seattle, on reinforcing bars.

A local hardware jobbing house has just imported 300 tons of German steel bars at a low price. This is the first large shipment of foreign bars into the Seattle market for some time.

Otis Company's Railroad a Common Carrier

WASHINGTON, March 30.—The Interstate Commerce Commission in a decision last week held that the Cuyahoga Valley Railroad, a subsidiary of the Otis Steel Co., Cleveland, is a common carrier and may lawfully participate in joint rates with other common carriers or have its switching charges on interstate shipments absorbed under proper tariff provisions by the carriers performing the line haul.

Annealing Wire in Salt Bath

New Process Claimed to Insure Uniformity in Heating and Better Surface—Heating Cycle Shortened

USING as a source of heating a liquid salt bath instead of a fuel-fired furnace, a method of annealing wire has been developed which seems to have considerable merit. The object of perfecting a method using a salt bath in the heat treatment of wire was to secure, if possible, a more uniformly annealed product and a better surface. As the work progressed in the development of the process and as the mechanical problems of operation were worked out, it was found, according to the experimenters, that the direct costs were no greater than the older methods and that considerable indirect economies resulted. These, it is

explained, were caused by the necessity of washing or pickling the wire to a less degree, to better annealing, to quicker turnover and to less storage and equipment.

The process, which is here described, is known as the Lavite annealing process which has been applied on a quantity production basis at the plant of the Atlantic Wire Co., Branford, Conn. The salt, to which is attached the name of Lavite, is a special preparation developed and used by the Bellis Heat Treating Co. for a number of years in special heat-treating methods applied to steel tools and other products.

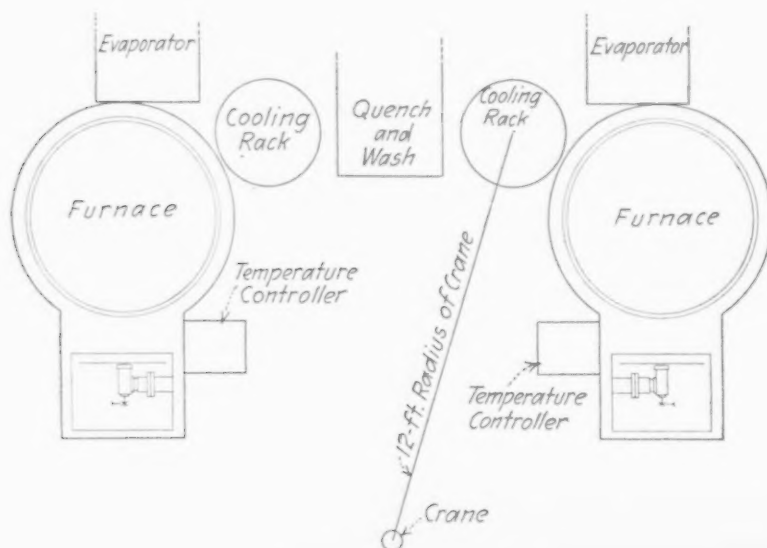
Briefly, the process consists in immersing the coils of wire in a bath of this salt, maintained at the annealing temperature, 1200 to 1300 deg., until the wire comes to the bath temperature, usually for a period of 12 to 17 min. The coils of wire, after being removed from the bath, are allowed to cool for the same period and then immersed in water. With certain grades of wire this cycle has to be varied: for example, non-ferrous alloys are usually quenched directly from the bath while high-carbon steel alloys are given a longer cooling cycle.

The characteristics of the salt for the bath are important. The material has to be stable, neutral to the metal and container, of proper melting point and capable of recovery by evaporation from the solution.

It is stated that eight 150-lb. bundles of low-carbon wire can be drawn through one hole to 0.0005 tolerance after this method of annealing.

The heating cycle is about 15 min. for a charge of wire, and the annealing process can be made a step in the drawing operations, it is emphasized, without storage or delays.

The most efficient unit is regarded as consisting of two furnaces, so that one operator with a helper can charge two bundles of wire (250 to 350 lb.) per furnace, each 15 min., and take care of all the handling and washing.



Plan for the Installation (Above) of Two Furnaces and Other Equipment for Annealing Wire in the Salt Bath for Cooling It in Water and for Recovering the Salt

(At Right) The Wire Is Carried by the Crane to the Two Circular Pot Furnaces



(At Left) From the Bath of Fused Salt the Wire Is Placed on Draining Racks to Cool Before Quenching in the Washing Tank. The evaporating tanks are located close to the furnaces

MR. WEIR, born in Pittsburgh, Aug. 1, 1875, started in the steel industry at 15 years of age, with the Braddock Wire Co., Braddock, Pa. A year later he went to the Oliver Wire Co., Pittsburgh. During 10 years there he acquired much practical steel plant experience that was helpful in his next connection, with the American Tin Plate Co., which he joined in 1901, first as manager of its Monongahela works and later at its Monessen mills. In 1905, in association with J. R. Phillips, he organized the Phillips Sheet & Tin Plate Co. at Clarksburg, W. Va., of which he became president in 1908. The name of the company was changed to the Weirton Steel Co. in 1918.

He is president of the Bank of Weirton, and a director of the Bank of Pittsburgh, National Association; Edgewater Steel Co., Oakmont, Pa.; Hanna Ore Mining Co., Cleveland; Redstone Coal & Coke Co., Brownsville, Pa.; Weirton Improvement Co.; Oak Hill Supply Co., located in Monongahela Valley, and the Peoples Bank of Holidays Cove, W. Va. Besides being a member of many clubs, he holds membership in the United States Chamber of Commerce, the Pittsburgh Chamber of Commerce, American Iron and Steel Institute, Engineers' Society of Western Pennsylvania, Civic Club of Allegheny County, and the West Virginia Manufacturers' Association.



ERNEST T. WEIR

WEIRTON ANNIVERSARY

Steel Co. Officials Dine Their President—Remarkable Growth of Company Traced

IN observance of the twenty-first anniversary of the Weirton Steel Co., Weirton, W. Va., which was organized April 1, 1905, officers and department executives of the company tendered a dinner to Ernest T. Weir, who since 1908 has headed the company, at the Duquesne Club, Pittsburgh, Saturday evening, March 27. Those present were: E. J. Anglin, W. H. Baldrige, A. J. Bopp, O. H. Burgham, L. D. Brueckel, H. G. Crisler, A. W. Duncan, A. S. Earp, H. M. Easton, C. V. Erdmann, F. E. Flynn, J. D. Gold, H. L. Gray, F. A. Hanlin, R. J. Hanna, F. B. Harrington, F. M. Hesse, J. M. Hill, C. H. Hunt, F. A. King, L. P. Lane, C. R. Meissner, George Mendel, E. M. Mentzer, W. F. Morris, Jr., A. E. Morse, E. W. Mudge, W. A. Murphy, H. E. McDonnell, H. M. McIntosh, J. P. Nelson, Harrison Nesbit, E. E. Paddack, D. M. Peterson, F. A. Pierce, H. J. Scanlon, H. C. Smith, C. M. Thorp, J. J. Watson, H. A. Weber, D. M. Weir, H. D. Westfall and J. C. Williams. A novel feature of the dinner was the fact that the place cards were fashioned from the lightest gage cold-rolled strip steel made by the company, 0.002 in. thick.

It was a tribute to Mr. Weir's leadership in the growth of the company from one producing only 20,000 tons of tin plate a year and employing but 300 men to a rounded out self-contained organization which, with its existing facilities and those to be completed in the next 12 months, will have annual capacity for producing 550,000 tons of coke, 550,000 tons of pig iron, 1,000,000 tons of ingots, 850,000 tons of semi-finished and 800,000 tons of finished products, including tin plate, sheets and hot and cold-rolled strip steel. The number of employees has grown to 8500.

At its inception 21 years ago the company had only the plant of the Jackson Sheet & Tin Plate Co., at Clarksburg, W. Va., a 5-mill tin plate plant. Today, the company has three tin plate plants, with 50 tin mills. The Clarksburg plant has 12 mills, while the old Pope Sheet & Tin Plate Co., Steubenville, Ohio, later acquired, has 12 mills and at Weirton the tin plate plant consists of 26 mills. With this capacity the company ranks first in production among the independent producers, with a total rated annual output of 5,000,000 base boxes. It has finishing mills with an annual capacity of more than 200,000 tons of hot and cold-rolled strip steel. The company has nine sheet mills with an annual capacity of 75,000 tons. It controls its ore and coal supplies.

Its primary steel producing units comprise one blast furnace with a rated daily capacity of 600 tons, with another of larger capacity under construction; its open-hearth plant, now consisting of seven 100-ton furnaces, will be increased this year by the addition of four 150-

ton units. The existing by-product coke plant of the company has 37 ovens, with 49 more under construction. River harbor and dock facilities under construction will permit coal, brought from the mines of the company above Brownsville, Pa., in river fleets, to be unloaded at the plant, and also will provide for the trans-shipment of finished products by river to the markets of the South and West.

The freight cars handled in and out of Weirton in 1925 would constitute a solid train, practically from New York to Chicago. The value of this freight business increased from \$796,500 in 1916 to \$5,752,400 in 1925, this being exclusive of the Steubenville and Clarksburg plants.

Mr. Weir has guided this transition from the small beginning at Clarksburg, with an investment of \$150,000, to the present investment of over \$40,000,000; from a production of 20,000 tons the first year to 800,000 tons of highly finished steel products; from 300 employees to 8500, and a payroll increase from \$240,000 per year at Clarksburg to over \$15,000,000.

Argentina's Purchases of Galvanized Sheets May Be Curtailed

Reports have reached the United States that American mills may lose all or part of the profitable trade they have had with Argentina in galvanized sheets, which have been used in large tonnages there as a protection to crops against locusts. The Argentinian Government intends to build a zinc sheet rolling mill, which will be used to reroll a large tonnage of zinc sheets, which were used extensively before the galvanized sheet was adopted for crop protection. It is reported that 50,000 tons of old zinc sheets are available in Argentina and these will be remelted and rerolled. It is expected that this tonnage will meet the requirements of the agricultural sections for years. The mill will probably be in operation by mid-summer.

To Make Rail Steel Bars at Birmingham

BIRMINGHAM, March 29.—Erection of a plant for the manufacture of rail carbon reinforcing concrete bars, light angles, flats, etc., reinforced fence posts and similar products, is announced by the Connors Steel Co., manufacturer of cotton ties, steel hoops and light bands, George W. Connors, president, the trade being notified that delivery of the various products will begin 60 or 90 days hence. This is a new product for this district. Chicago and St. Louis are the closest manufacturing points at present. The angles will be used by the bedstead people throughout the South and reinforcing bars will of course be offered for buildings and bridges. The new plant will double the output of the Connors Steel Co., it is understood. The Connors company has been bringing in French billets for the past several months, besides using local steel.

The Dwellings of Tomorrow

V.—What Has Been Done to Increase the Use of Iron and Steel for Homes Here and Abroad

BY PRENTICE WINCHELL

ONE fine spring morning in 1899 the readers of the *New York Journal* laughed pleasantly at the ridiculous idea suggested by a cartoon in their morning paper. This unusual illustration by Homer Davenport depicted Uncle Sam solemnly observing one of the first horseless carriages. The caption read "No Oats! No Hay! No Shedding of Hair! No Tender Feet! Can Run All Day! We Are Sorry, But to the Horse, Good-Bye!!!" In the background, a forlorn mare sadly turned her head from this disheartening prophecy.

What Homer Davenport foresaw 27 years ago has not yet come to pass, but the forecast was close enough to the truth to cause a considerable surprise to those who remember that famous cartoon. Today the iron and steel industry has a very sizable "stake" in the automobile business.

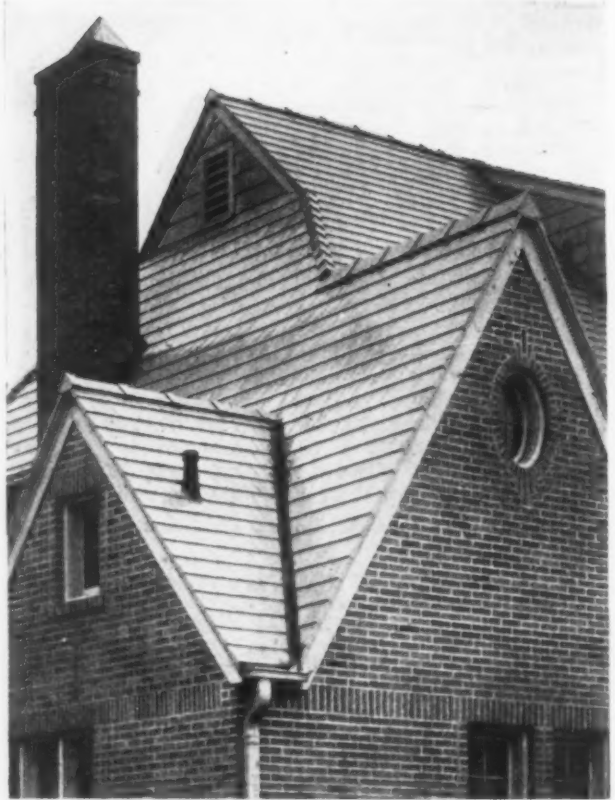
Men of vision in the metal trades today foresee an equally important development in the market for iron and steel in the building trades. Very possibly the dwelling of 1950 will be as unlike the small house of today as those first awkward gas-buggies differ from the limousine of 1926, but an unbiased analysis of what has been and is being done with iron and steel in home building shows that we are well beyond the experimental stage.

For while the idea of metal for houses is not new, more headway has been made in the last three years than in the previous thirty. Some of this, no doubt, is due to the fact that the war prevented ordinary construction and left the heritage of a dwelling shortage. Such an explanation serves for the great activity in metal houses in England but scarcely furnishes the reasons for the sudden and marked increase in activity in this country along these lines.

English Metal Houses

THE chief types of iron and steel houses erected in England and Scotland are the Telford or Braithwaite, the Atholl (sometimes called the Beardmore), the Weir, the Dennis-Wild and the MacFarlane. About a year ago Parliament voted an appropriation of £50,000 for the development and erection of several houses of these types. Since that time many changes in method of construction have been made and many contracts awarded for construction in different cities. Descriptions of these houses have appeared in *THE IRON AGE* and other publications but a brief summary of the principal methods employed will emphasize the fundamental differences between the English and American systems of development.

The Braithwaite or Telford house, designed by J. C. Telford, managing director Braithwaite & Co., Ltd., West Bromwich, Staffordshire, is of the all-steel type. External walls and partitions are made of flanged steel plates 3 ft. 6 in. wide. External walls are painted warm stone color and sand sprinkled while wet. These plates are so joined as to give the required strength to support the roof and upper story loads. Inner walls are of asbestos sheets on wood studding, with a 6-in. air space for insulation. This air space extends to the roof and to the exterior lining of the cast iron chimney flues and is sealed. Heat radiating from the flues in the chimney breast is transmitted through the cavity wall and roof space. The roof is of sheet steel. It is claimed



Vitrified Metallic Tile Roof Made of 22 Gage Armco Ingot Iron With an Enameled Finish Which Can Be Had in Many Colors and Is Extremely Resistant to Weather. It is easily handled and can be applied to any type of roof construction

that the houses can be erected in less than three weeks. They are estimated to have an average life of 40 years when properly painted.

The Weir house is built on a regular wood frame and uses steel sheets for exterior walls and partitions as well as roof. This house is made by G. W. J. Weir & Co., Ltd., Cathcart, Scotland.

The Atholl type, made by Sir William Beardmore & Co., Ltd., shipbuilders, Glasgow, to plans of the Duke of Atholl, employs a frame similar to those made of metal lumber in this country, sheet steel exterior walls, asbestos board insulation and more nearly approaches the houses now being erected in this country than any other except the Dennis-Wild.

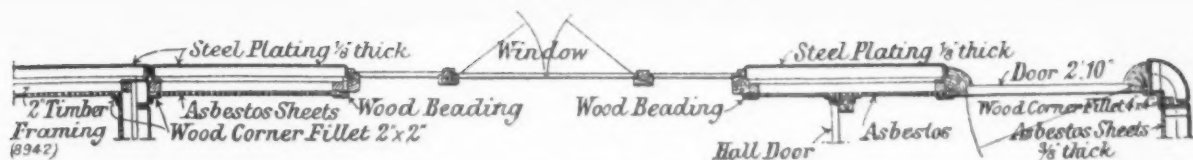
The Dennis-Wild system employs a steel frame made of angles but is designed for brick or stucco exterior.

The MacFarlane house, offered by Walter MacFarlane, of Glasgow, and used by the Glasgow Corporation, is of cast-iron and was described in *THE IRON AGE*, March 4, 1926, page 622.

With the exception of the Dennis-Wild houses, all these types employ bitumastic paints or a cork composition for the interior surface of iron or steel plates to counteract "sweating." All steel-frame parts, where used, are thoroughly painted before erection.

There has been dissatisfaction with these houses, not alone on the score of appearance, though something might, perhaps, be said in this regard, but particularly on the part of builders. When a large number of uniform houses are manufactured in the shop and erected in quantity, the local builder has no opportunity for profit and the local building labor is naturally antagonistic when wages are forced down to make the construction cheaper. A statement in the London *Economist* points out that, whereas some £28,800 had been allotted for the construction of the Telford, Weir, Atholl and Dennis-Wild types early in 1924, only 51 houses had been completed in December and only a few were in process of erection. Dissatisfaction of local builders is to a considerable extent responsible for this.

The fundamental principle which the English iron and steel companies stress is that of economy and employment for idle workers. There is a tacit admission



This Cross-Section of a Wall in the Telford or Braithwaite Type of Steel House Used in England and Scotland Shows the Method of Insulating With Asbestos Composition Sheets and the Use of Wood Studding Which May Eventually Be Replaced by Steel

that the houses lack something of beauty and perhaps of utility.

Interchangeable Parts Here

HOW striking is the difference when the conditions in the United States are compared with this situation. Here a large number of concerns in the metal trades, sensing an increase in ultimate consumption of their products, have experimented with a view to producing better homes, with the item of cost a secondary consideration. Steel casement and basement windows, metal lumber fireproof construction, metal doors and roofing—all originated in the idea that iron and steel is basically a better building material.

The chief types of construction now in use in this country are the steel-frame and fireproof floor construction using stock metal lumber; the Broderick steel-frame system described in THE IRON AGE, March 18; various applications of a welded steel frame with expanded metal lath and stucco or cement plaster; and the all sheet-steel house designed by the Eslien Co., 3028 Pemberton Avenue, Milwaukee.

The "Stuko-Steel" house is fabricated by the William Horn Structural Iron Works, 336 North Leavitt Street, Chicago, and consists of a frame made of cold-rolled steel channels welded in unit frames capable of easy handling (about 3 ft. 6 in. x 6 ft.), covered with wire lath on both sides, backed by heavy sheeting and welded to the channel, dipped and coated with a rust preventive paint. When this frame is covered with stucco, a dead-air space of 4 in. provides insulation against heat and cold.

The "Weldcrete" system devised by James G. Dudley, 25 Broadway, New York, consists of a framework of rolled steel shapes, metal lath welded on inside and outside to form a base for stucco or cement-plaster and a number of cross-pieces known as septums, which fit into the framework parallel with the floor, providing rigidity and forming small dead-air spaces for insulation.

The Eslien method of construction employs a frame

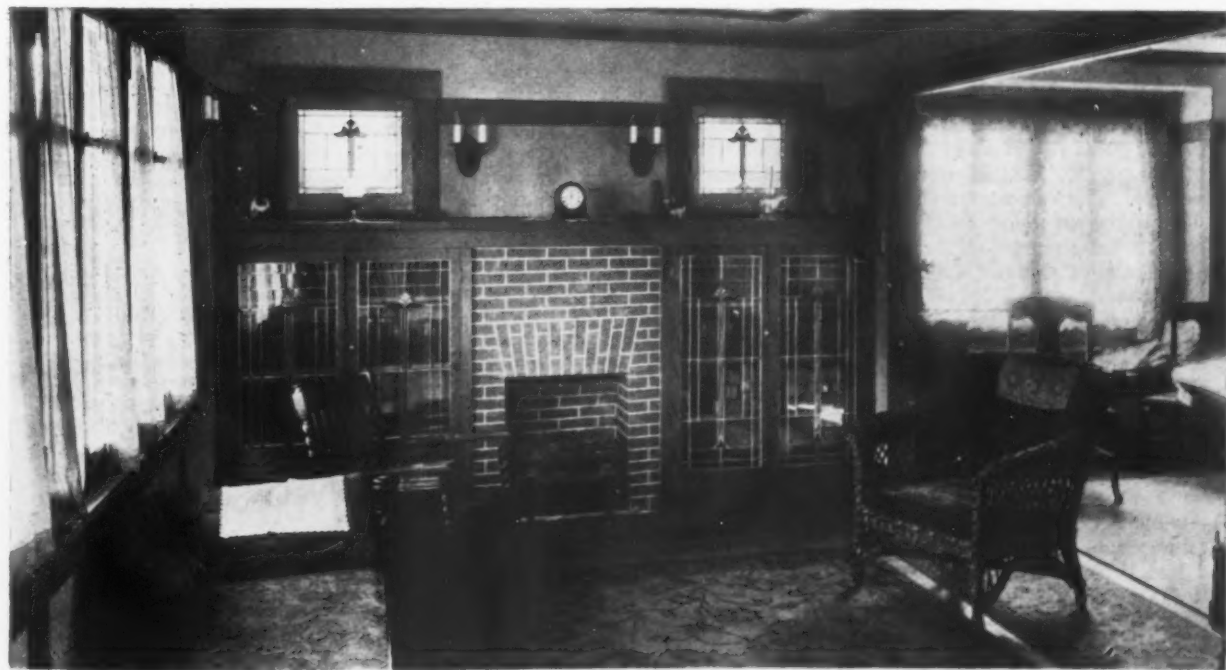
work of light structural angles covered with No. 26 gage galvanized sheets, with wood studding and a gypsum-board interior wall for plastering.

Note that in each case material is provided in standard units, which may be carried in stock by local building supply dealer and sold to the builder. In the case of metal lumber, distribution is already well advanced and even in the case of the other types, the handling of a number of standard size, interchangeable frames is not an obstacle from a commercial standpoint. In fact, it has been estimated that the actual inventory investment which it would be necessary for a builder to make might well be 20 to 30 per cent less with iron or steel frames than in the case of wood members represented by timbers 2 x 4, 2 x 6 and 2 x 10 in. in size, etc.

Approximately twenty builders are at the present time engaged in building steel-frame or steel and stucco dwellings in the United States. These builders have in many cases been instrumental in the development of a system of using iron or steel, motivated by a desire for better and safer building materials.

Steel basement columns are coming into wider use for dwellings each year. Metal lumber is made by several companies and their entrance into the small house field has already been discussed in THE IRON AGE. The tonnage going into steel casement and basement windows increases steadily. T. N. Jacobs, merchandise sales manager Detroit Steel Products Co., says: "A survey which we have made of the possibilities of steel basement windows shows that builders are using from one to four more basement windows per house than formerly."

Phillip Graff, sales manager of the Simmons Co., Kenosha, Wis., recently wrote in a bulletin of the Sheet Steel Trade Extension Committee, "Last year the yardage of stucco walls and plaster partitions with lath of one sort or another, in new buildings only, would have necessitated, if equipped with metal lath, 750,000 tons of different types. The proper dissemination of information will create a heavy demand for metal lath."



Living Room in the All-Steel Home of George L. Kohn, Sales Manager Eslien Co., Milwaukee. This house at Whitefish Bay, Wisconsin, cost about \$1,250 exclusive of plumbing, heating, wiring, and the fact that six tons of coal keep it very comfortably warm in the coldest winters speaks well for this method of construction. Sheet steel forms the exterior walls and a gypsum board the interior. The fireplace is made of galvanized steel

Malleable Iron Problems to Be Discussed at Round Table Meeting

A novel feature planned for the benefit of malleable foundrymen attending the Second International Foundrymen's Congress at Detroit the week of Sept. 27 to Oct. 1 will be the round table discussion of practical shop problems. The discussion will be informal, following a luncheon, and is being planned for the benefit of the practical shop man as well as the metallurgist and executive. Some of the subjects which have been advanced for discussion are as follows:

- Advantages of old or new sand in making cores.
- Method of disseminating scrap information to foremen and molders.
- Pattern standardization with a view to determining most economical sizes for bench and squeezer jobs.
- Methods of avoiding shrinkage in malleable castings and the extent to which it is commercially feasible to go in eliminating those faults.
- Characteristics which affect unfavorably the machining qualities of malleable castings.

F. L. Wolf, technical director the Ohio Brass Co., will preside as chairman. The regular technical session on malleable iron will be featured with addresses by Enrique Touceda, consultant for the American Malleable Castings Association; H. A. Schwartz, research director The National Malleable & Steel Castings Co., and D. M. Scott, works manager The Symington Co., Rochester, N. Y.

Officers of Chicago Metal Trades Association

At the twenty-eighth annual meeting of the Chicago branch, National Metal Trades Association, held Wednesday, March 24, the following officers were elected to serve for the ensuing year: President, Charles E. Finkl, manager A. Finkl & Sons Co., Chicago; vice-president, Thomas S. Hammond, president Whiting Corporation, Harvey, Ill.; treasurer, Arthur E. Blackwood, vice-president Sullivan Machinery Co., Chicago.

The executive committee is as follows: L. A. Dolton, Fulton Machine Co., Fulton, Ohio; William Ganschow, president William Ganschow Co., Chicago; Sterling Morton, president Morkrum-Kleinschmidt Corporation, Chicago; F. A. Prahl, vice-president Continental Can Co., Chicago; Harold C. Smith, president Illinois Tool Works, Chicago, and Charles H. Strawbridge, president Goodman Mfg. Co., Chicago.

New Steel Institute Directors

Two new directors were elected at the meeting of the directors of the American Iron and Steel Institute held on Friday, March 26. They are R. H. McMaster, president Steel Co. of Canada, Ltd., Hamilton, Ontario, and Howard M. Hanna, president M. A. Hanna Co., Cleveland. The vacancy in the Canadian representation on the board was due to the recent death of Robert Hobson, who preceded Mr. McMaster as president of the Steel Co. of Canada, Ltd.

Foundry Instructors to Hold Second Annual Meeting

Following the successful meeting of foundry instructors held in conjunction with the 1925 Syracuse meeting of the American Foundrymen's Association, plans have been made to make this an annual affair. The second meeting will be held at Detroit at the time of the Second International Foundrymen's Congress and the thirtieth annual convention of the American Foundrymen's Association. Foundry instructors in the various technical colleges and schools throughout the country have been invited to participate. The business will take the form of reading short papers descriptive of the foundry courses at Purdue University, Carnegie Institute of Technology and the Universities of Michigan and Illinois. Following the reading of these papers the meeting will be thrown open for a general discus-

sion. In addition, the committee in charge of this group meeting is planning an inspection trip to the University of Michigan.

All foundry instructors attending the meeting will be invited to participate in the technical sessions.

American Zinc Institute to Meet in St. Louis

The annual meeting of the American Zinc Institute will be held at the Hotel Coronado, St. Louis, April 19 and 20. Among the papers to be read will be the following: "Smelter Recovery of Zinc," by C. E. Sieben-thal of the United States Geological Survey; "Possible Improvements in Metallurgical Practice Relating Particularly to Zinc Industry," by Dorsey A. Lyon, assistant director of the Bureau of Mines. C. L. Patterson will talk on plans of steel mills for the promotion of sale of galvanized sheets, and Capt. J. A. Stader, of the economics branch of the Bureau of Mines, will report on the progress being made in simplified practice.

Employment Gains in Metal-Working Shops

A total of 652,844 employees was reported for the month of February by more than 850 shops in the membership of the National Metal Trades Association, Chicago. This number was larger than any total reported in five months, comparing with 635,104 for January, 491,747 for December, 636,151 for November, and 637,160 for October. The plants reporting are located in New England, New York, New Jersey, Pennsylvania, Ohio, Indiana, Michigan, Wisconsin, Illinois, Iowa and Missouri. All sections showed gains, the largest by Detroit, which reported 271,927 employees for February, as compared with 263,842 for January.

John F. Gowen, representing the Producers' Research Council and the Copper and Brass Research Association, addressed the Washington chapter of the American Institute of Architects at Seattle on April 3. The Producers' Research Council, composed of manufacturers of building materials, is organized to secure better relations between architects and manufacturers.

COMING MEETINGS

April

American Oil Burner Association. April 6 to 8. Third annual convention and exposition, Book-Cadillac Hotel, Detroit. Leod D. Becker, 350 Madison Avenue, New York, secretary.

National Metal Trades Association. April 15 and 16. Twenty-eighth annual convention, Hotel Astor, New York. J. E. Nyhan, Peoples Gas Building, Chicago, secretary.

American Welding Society. April 21, 22 and 23. Annual meeting. Engineering Societies Building, New York. Miss M. M. Kelly, 33 West Thirty-ninth Street, New York, secretary.

Foundry Equipment Manufacturers' Association. April 22 and 23. French Lick Springs, Ind. H. Cole Estep, Penton Publishing Co., Cleveland, secretary-treasurer.

American Electrochemical Society. April 22 to 24. Annual meeting, Chicago Beach Hotel, Chicago. Colin G. Fink, Columbia University, New York, secretary.

National Supply and Machinery Distributors' Association. April 26, 27 and 28. Twenty-first annual convention, Ambassador Hotel, Atlantic City, N. J. George A. Fernley, 505 Arch Street, Philadelphia, secretary-treasurer.

National Foreign Trade Council. April 28, 29 and 30. Thirteenth annual convention, Charleston, S. C. O. K. Davis, India House, Hanover Square, New York, secretary.

A Notable Career in Steel

Retirement of John Reis as Vice-President of Steel Corporation

CARRYING out a purpose expressed to his associates some months ago, John Reis gives up on April 9 the duties of vice-president of the United States Steel Corporation. On that day he reaches the age of 65, the point which he had marked for retirement from an active business career. Mr. Reis's work with the Steel Corporation, prepared for in his long experience in iron and steel making in the Central West, has had to do with the planning and carrying out of the new construction programs of the corporation. As is well known in the industry, the problems dealt with in that connection in the past 21 years have been many and of high importance.



The Reis name has been a notable one in the industry. Mr. Reis's father and his five brothers were all identified with iron and steel manufacture. W. E. Reis, his brother, was president of the National Steel Co., one of the consolidations that entered into the Steel Corporation. George L. Reis, at the time of his retirement a few years ago, was vice-president of the Minnesota Steel Co., the Duluth subsidiary of the corporation. In the eighteen-sixties the father, George C. Reis, formed at New Castle, Pa., the firm of Reis, Brown & Berger, which became one of the largest manufacturers of rolled iron in the United States at that time. In the 75 years in which the family has had to do with the iron industry the productive capacity of the country, represented at the beginning of that period by 2,500,000 tons of puddled iron a year, has grown under successive multiplications to the more than 54,000,000 tons of steel ingots of today. The open-top blast furnace of 75 years ago commonly made seven to eight tons a day; recently over 700 tons a day has been reached by a blast furnace producing steel making iron.

Niles, Ohio, was John Reis's birthplace. His common school education was received at New Castle, Pa.

From school he went into the works at New Castle operated by two of his brothers, acquiring there the trade of plate and sheet rolling and at the Neshannock furnace, also operated by Reis Brothers, a knowledge of blast furnace practice.

In 1886 he was vice-president and general manager of the Gogebic Furnace Co., Iron River, Mich., manufacturer of charcoal pig iron, and two years later became manager of the Nashville Iron, Steel & Charcoal Co., with furnaces at West Nashville, Tenn. In 1889 he was with the Tennessee Coal, Iron & Railroad Co. as manager of Alice furnace, at Birmingham, Ala., and in 1891 had charge of the blast furnaces of the Watts Iron & Steel Syndicate, Ltd., Middlesboro, Ky. In 1893 Mr. Reis went with the Oliver Iron & Steel Co. at Pittsburgh as manager of Edith furnace. At this time Mesaba ores were coming into use, and it was first demonstrated at this furnace that large quantities of these fine and dusty ores could be successfully used in blast furnace operations. At Edith furnace and at Rosena furnace, at New Castle, of which Mr. Reis also had charge, 100 per cent Mesaba mixtures were charged with successful results.

In 1899, at the formation of the National Steel Co., he was made general manager of all blast furnace operations of that company, which had 16 furnaces operating and three building. On the organization of the United States Steel Corporation in 1901, operation of the plants of the National Steel Co. was taken over by the Carnegie Steel Co., and Mr. Reis was made general superintendent of the Shenango Valley district, which included all blast furnaces, steel works and rolling mills at New Castle and Sharon, Pa. In 1905 he went to New York as assistant to President William E. Corey, and became vice-president of the Steel Corporation in 1911.

All appropriations of the manufacturing subsidiary companies for extensions, reconstruction and building of new plants passed through Mr. Reis's hands for his investigation and recommendation. When large extensions were being considered in the West, which finally led up to the construction of the Gary plant, Mr. Reis made a report to the president's committee covering markets, type, character and capacity of mills, furnaces and steel works to be installed, and the estimated cost. This report recommended cutting loose entirely from the common practice of driving mills, furnaces and electric power plants with steam engines and installing instead gas engines for blowing blast furnaces, also gas engines for generating power at central power stations and driving all mills and auxiliaries by electric motor. This was carried out with notable economy.

Republic Company to Rebuild Another Haselton Furnace

YOUNGSTOWN, March 29.—The Republic Iron & Steel Co. has awarded a contract to the W. B. Pollock Co., Youngstown, to rebuild and enlarge No. 2 blast furnace in its Haselton group. The work will require five months, and the furnace will be enlarged from 500 to 600 tons daily capacity. With this stack rebuilt, the Republic company will have reconstructed four furnaces in its Haselton battery.

Ohio Melt Shows Decline for February

The melt of foundries belonging to the Ohio State Foundrymen's Association was 73.9 per cent of normal melt for February, which is a slight decline from 76 per cent reported for January. The melt in February, 1925, was 71.4 per cent of normal. The normal melt for the foundries reporting totals 21,801 tons, against which there was actually melted 16,123 tons in February, 1926. Stocks received in February increased to 69.1 per cent, as compared with 64.3 per cent in January and 57.8 per cent in February, 1925. Stocks received is a total of all grades of pig iron and non-ferrous material, and all grades of scrap, ferrous as well as non-ferrous. The total for February, 1926, was 15,075 tons, or 69.1 per cent of the normal melt.

Stocks on hand increased to 91.4 per cent in February, as against 76.9 per cent in January and 106 per cent in February a year ago. Non-ferrous operations increased to 66.6 per cent in February from 59.2 per cent in January. Operations in February, 1925, stood at 69.6 per cent.

Acquires Mueller Machine Tool Company's Line

The Cisco Machine Tool Co., Cincinnati, has purchased the line of the Mueller Machine Tool Co. of the same city and plans to manufacture the Mueller radial drills which range in size from 2 ft. to 4½ ft. Although the Cisco company does not intend to manufacture the Mueller lathes, it is prepared to furnish repair parts and attachments for them. The plant and equipment of the Mueller company were sold to the Shepard Elevator Co., Cincinnati, as noted in THE IRON AGE of March 11.

A large sponge iron plant will be built in Japan by the Worden-Allen Co., Milwaukee, for the Gora Matsakata, Yokohama. It will require 1000 tons of structural material. The design is by Thornhill & Anderson, American engineers, West Allis, care of the Allis-Chalmers Co., Milwaukee.

Dissatisfaction with Wages Among Sheet Mill Workers

PITTSBURGH, March 30.—There is more than ordinary interest in the annual convention of the Amalgamated Association of Iron, Steel and Tin Workers of North America, which will open at the Eagles auditorium here next Tuesday, because if there has been a subject that has been more freely discussed than others, notably in the columns of its own publication, *Amalgamated Journal*, it is the preamble and the sliding scale features of the agreement the organization has with a number of sheet and tin plate manufacturers. Although the agreement provides that propositions as to wages and working conditions shall not be considered at the annual conference of manufacturers and representatives of the association unless presented 90 days before the annual convention of the association, and interested manufacturers must know what they will be expected to consider, nothing yet has been made public as to the demands of the union workmen.

It can be predicted with safety, however, that there will be demands calculated to insure higher wages than the men have had under the existing agreement. It is idle to attempt to conceal the fact that the men subject directly or indirectly to the Amalgamated by monthly wage settlements have been dissatisfied. It was in recognition of the fact that its men were not faring as well as other classes of labor that led the American Sheet & Tin Plate Co. a short time ago to abandon the practice of basing its wage scales on these 60-day settlements and to work out a new plan that has for one of its premises a definite relationship between wages of skilled and common labor.

The common labor rate in the steel industry is 44c. per hr. and that rate has ruled since Sept. 1, 1923. A skilled labor rate based on the common labor rate during this time would have remained stationary regardless of market fluctuations, which have been pretty consistently downward since 1923. The most recent sheet wage settlement disclosed an average price of 3.20c. per 100 lb. for Nos. 26, 27 and 28 gage black sheets; the three previous settlements showed an average of 3.10c., while the late 1923 settlements disclosed 3.75c. For every 5c. per 100 lb. change in the average sales price there is an increase or decrease of 1½ per cent in the wages of all members of the mill crew.

To Establish Mileage Scale in South

WASHINGTON, March 30.—Rates on iron and steel products from Southern producing points to destinations east of the Mississippi River and south of the Ohio and Potomac Rivers were ordered placed on a mileage basis by the Interstate Commerce Commission yesterday. This will replace the old basing point system. The action followed applications by the railroads for permission to disregard the long-and-short haul section, under the new method, as they have been doing under the existing system. The old basis has been abandoned in practically all sections of the country except the South.

The change was brought about through three orders, one relating to general iron and steel products, another to bale ties and buckles and the third to track material. The orders allow the carriers to establish rates over the circuitous routes in conformity with the so-called equi-distant rule, and for distances not governed by this rule are to be made in conformity with mileage scales. In each of the three orders the scale begins with a distance of over 460 to 480 miles inclusive, and the rates advance 1c., with certain exceptions, for every 20 miles up to 800 miles, after which there are 25-mile blocks. The rate is the same for any distance between 780 and 825 miles for general iron and steel products and between 850 and 900 miles for track material. In the case of the latter, advances are 1c. for each 50 miles beyond 900 miles. The scale on general iron and steel products begins at 42c. per 100 lb. for 480 miles and over 460 miles, and reaches a maximum of 63c. for 1000 miles and over 975 miles. The scale on ties and buckles begins at 33c. for 480 miles

and over 460 miles, and reaches a maximum of 49c. for 1000 miles and over 975 miles. The scale on track material begins at 29c. for 480 miles and over 460 miles, and reaches a maximum of 44c. for over 1025 miles to 1075 miles.

Comprehensive Program For Providence Meeting of Mechanical Engineers

Two machine shop practice sessions, one devoted to small parts manufacture and the other to pressed metal, are among the features planned for the Providence meeting of the American Society of Mechanical Engineers, which will be held in Providence, R. I., May 3-6.

At the session on small parts manufacture, Tuesday morning, May 4, papers to be presented include: "Influence of Design on Production," by Earle Buckingham, Massachusetts Institute of Technology; "Development of Tap Drill Sizes," by A. C. Danekind, and "The Specification and Control of Mechanical Springs," by J. K. Wood, consulting engineer, New York.

"New England Conditions Affecting the Machine Tool Industries" is the title of an address to be made by E. C. Mayo, vice-president and general manager of the Gorham Mfg. Co., Providence, at the pressed metal session, which is scheduled for Wednesday morning, May 5. Rotary swaging will be discussed at this session by J. H. Connolly, general manager Standard Machinery Co., Auburn, R. I., and a paper on cold drawn steel will be presented by F. W. Krebs.

The opening session on the afternoon of May 3 will be devoted to education and training for the industries. W. A. Viall, vice-president of the Brown & Sharpe Mfg. Co., will speak on: "Has Need for Apprenticeship Passed?" and Frank Cushman will present a paper on: "Training for Foremanship."

"Schemes for Supplying Power and Heat to Industrial Power Plants," by M. K. Bryan, engineer, Boston, will be one of the papers at a session devoted to industrial power. Another contribution will be by S. D. Fitzsimons, plant engineer of the Brown & Sharpe Mfg. Co., on "Industrial Boiler Efficiencies." Other sessions will be devoted to the wood industries, central power stations and textiles.

Social features have been unusually well planned. There will be a reception and inspection at the Rhode Island School of Design, on the evening of May 6, and a luncheon at the Biltmore Hotel, May 4. A Rhode Island clam bake at Rehoboth, Mass., is scheduled for Tuesday evening, May 4. On Wednesday evening there will be an informal dinner at the Biltmore Hotel, Providence. Social and sightseeing activities for ladies have been amply provided.

Visits will be made to several manufacturing plants, including the Brown & Sharpe Mfg. Co., the Gorham Mfg. Co., Grinnell Co., and the Narragansett Machine Co. On Thursday, May 6, there will be an all-day trip by boat to Newport to visit the torpedo station and to view exhibitions of torpedo firing.

New Japanese Tariff on Iron and Steel Becomes Effective

WASHINGTON, March 30.—The new Japanese tariff became effective yesterday, according to a cablegram received by the Tariff Division, Department of Commerce. It passed the Upper House of the Diet on Wednesday unchanged from the form in which it passed the Lower House. The measure provides for a general upward revision of rates. Iron and steel products affected include steel bars, rods and tee angles, which are increased from 15 per cent ad valorem to 1.10 yen (55c. at normal rate of exchange) per 100 kin (133 1/3 lb.); rails and fish plates increased from 15 per cent ad valorem to 0.95 yen per 100 kin, and wire rods from 15 per cent to 18 per cent ad valorem. The duty of 0.30 yen per 100 kin on electrical sheets continues unchanged.

Reducing Waste in Machine Shop

Results Achieved Through Division of Labor, Inspection,
Reclamation and Intelligent Management Dis-
cussed at Chicago—Human Element Stressed

WASTE in the machine shop can be neither reduced nor eliminated without the coordination of proper and adequate equipment, suitable materials, approved methods and good workmanship, and cooperation between employer and employee. This was the basic thought advanced in five papers constituting a "Symposium on Wastes in the Machine Shop," presented at Chicago, March 24, in a joint meeting of the Chicago section of the American Society of Mechanical Engineers and the Western Society of Engineers.

Specialization of Tasks Reduces Waste

"The Division of Labor in Tool Manufacturing" was the title of a paper by G. A. Pennock, technical superintendent Western Electric Co., Hawthorne Works, Cicero, Ill. This company has found that the main factor contributing to elimination of waste has been a gradual decline in the use of the all-around craftsman, skilled in all phases of tool making, and a concurrent development of specialists in the various machine and bench operations.

In the manufacture of telephone equipment the Western Electric Co. has the problem of making some 110,000 different parts, which are assembled into 13,000 separate and distinct pieces of apparatus. This involves not only many of the commoner wood and metal-working operations, but also such processes as glass making, textile dyeing, copper rolling and wire drawing, the insulation of wire with textiles, enamel and paper, and the manufacture of porcelain, electrolytic iron, phenolized fiber, soft and hard rubber in the form of sheet, rod, tube and molded shapes.

At the Hawthorne plant there is approximately \$12,000,000 invested in tools and \$1,000,000 in tool room equipment. During 1925, 4400 major tools were manufactured at a cost of about \$850,000, and \$485,000 worth of small tools, such as special milling cutters, reamers, taps, button dies and wrenches were made. In addition to these new tools 30,000 tools were repaired at a cost of \$54,000. Altogether the tool room during 1925 built or repaired tools of all types at a cost of \$1,875,000. Individual jobs ranged from a \$12,000 punch and die to an engraving cutter costing less than 2c.

Work of All-Around Tool Maker Divided

In 1895 the Western Electric Co. had just one type of employee, the tool maker or all-around craftsman. Today some ten general types of employees are engaged in tool manufacture, ranging from planning engineers to machine hands.

The work is divided up as follows:

1. Planning
2. Tool designing
3. Tool ordering
4. Actual manufacturing

Instead of the tool maker, the planning organization now determines the kind and type of tool to be made, based upon the annual demand for the part. If, for example, the annual requirements in a small part are 10,000 or less, the simplest tools are ordered. This is

logical because the cost of producing such a small quantity is almost negligible compared to the tool cost which would be incurred if elaborate production methods were attempted. If, on the other hand, the requirements are as high as 1,000,000 pieces a year, more efficient and higher priced tools would be justified. For a still larger annual output only the most efficient tools would be considered, such as multiple compound and multiple forming tools, tools combining two or more operations and equipped with dial or hopper-feeds.

Tool Designing Handled by Four Departments

Tool designing is divided into four departments: the punch and die department, the jig and fixture department, the gage department and the screw machine tool department. Each group of designers works almost entirely upon one particular type of tool—a fact which makes for a more efficient design and lower design cost. Considerable has been accomplished in standardizing designs, thus eliminating the necessity of making a complete tool design for each tool. The standard designs show the complete standard tool. In the case of a standard punch and die the only drawing that is required is a layout showing the part to be made, which, together with the standard parts previously mentioned, is all the information required by the tool room to complete the tool. The standard parts to be used are designated on the tool drawing or tool layout by the numbers under which they are stocked.

Division of Labor in Shop Work

In the shop, specialization of work is carried even further than in the tool design division. The tool room is divided into the following main groups: the milling machine section, lathe section, grinding section and the bench work section. These groups are still further subdivided. For instance, in the lathe section are specialists on threading plug gages and master taps, and still others who turn only circular-form tools.

Every operation is carried out by a man skilled in a particular work to such a degree that a minimum amount of time is required in setting up work and maximum speed and accuracy are assured. Furthermore, as the various operations require differing degrees of skill and craftsmanship, help of a lower grade than the old-time tool maker can be employed on many of them, thereby reducing labor costs. Also, with such an organization, a minimum number of machines and bench positions are required, and the work can more readily be scheduled.

Close Tolerances Require Careful Tool Inspection

Expert tool inspection requires not only ability to interpret drawings and to make measurements with great accuracy, but technical understanding and a sense of the proper and economical use of tools and of the inspection gages to be employed. As an illustration

(Continued on page 963)

WASTE reduction at Western Electric Co. marked by passing of all-around craftsman and increase in specialization.

Careful inspection of tool steel essential even in a small machine shop.

Illness in industry causes an average time loss of seven days per employee annually.

Too many shops place the entire responsibility for management policies on the superintendent.

Reclamation of scrap at Santa Fe plant means saving of over \$300,000 a year.

ESTABLISHED 1855

THE IRON AGE

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Steel Houses Here and Abroad

THAT steel is today practical building material for dwelling houses has been emphasized anew in articles that have appeared in THE IRON AGE in the past four weeks. Among the latest developments are contracts for 1000 steel-frame houses to be erected by the London County Council and the report that 2000 all-steel houses of the Weir and Atholl types (described in this issue) will be erected this spring by the Scottish National Housing Association. Several hundred steel and iron houses are already completed or under construction in England. The tonnage involved is sizable, assuming an average of six tons for the framework and fifteen tons for the completed structures of the bungalow type. But present tonnage is of far less importance than the possibilities opened up by the introduction of metals into the field of small houses.

One noteworthy difference between the British and American use of steel in houses augurs well for these possibilities. In England, the construction of such houses has come about chiefly as a result of the pressing need for cheaper dwellings. "The steel houses will undoubtedly be cheaper than others," says a dispatch from London to the New York Times. In this country, on the other hand, the steadily increasing experimentation with metal lumber, steel framing, roofing, etc., has been chiefly in answer to the demand for better housing.

English builders seem agreed that, under the system of standardized houses as adopted by the large building programs, beauty and comfort must be sacrificed to some extent in favor of cheaper rentals.

In the United States, however, architects and builders who have erected steel-frame houses are not yet ready to stress the factor of economy, seeing that they have a better argument—that of a superior type of construction. The experimental houses built in this country have been designed with an eye to greater safety, strength, durability, heating economy, living comfort and beauty. American advocates of iron and steel for houses are content for the present to rest their case on the manifest advantages of metal construction, with the assurance that, with each increase in the

relative cost of lumber and each step forward in demand permitting large-scale production of iron and steel parts, the economy factor will take care of itself.

The idea of large numbers of uniform houses as similar as a row of children's blocks may be swallowed if the accompanying reduction in rentals is sufficient, but the suggestion of more comfortable and beautiful houses built with iron and steel needs no flavoring to make it palatable.

As a matter of fact, the extent to which steel houses come into their own depends on whether they are better houses, regardless of price.

The Steel Corporation's Share

WHAT proportion of the total steel business is done by the United States Steel Corporation? The question is of perennial interest. While the Steel Corporation's tonnage has been increasing, its proportion has been decreasing, and last year the drop in proportion was particularly noticeable, for, while the industry at large made a new high record in steel ingot production, the corporation's output had been exceeded in no less than five other years.

In 1902, its first full year, the Steel Corporation made 67 per cent of the ingots. Thereafter, the proportion fell sharply, the tendency not being arrested for even a single year by the Tennessee company absorption in 1907. In the past 13 years, including the pre-war year, the proportion has been as follows:

Steel Corporation's Proportion of Ingot Production

Per Cent		Per Cent	
1913.....	55.0	1920.....	47.2
1914.....	51.8	1921.....	57.2
1915.....	52.4	1922.....	46.5
1916.....	50.5	1923.....	46.8
1917.....	46.5	1924.....	44.8
1918.....	45.5	1925.....	42.8
1919.....	51.0		

Last year may be regarded as presenting normal conditions in respect to this proportion. Some of the years were abnormal. In 1919 the corporation's proportion ran high because late in the war it had been willing to book orders subject to shipment when restrictions should be removed.

In 1921 it profited from the very moderate price policy it had pursued in 1920.

The report for 1925 states that the subsidiaries "operated during the year at an average of 78.4 per cent of their capacity, measured by the tonnage output of rolled and finished products for sale." These products, as sold, run from billets, sheet bars, rods, etc., to such finely finished products as wire nails, tin plate, finished structural work, car wheels, etc., the total production being 13,272,010 tons. Dividing this by the 78.4 per cent factor gives about 16,900,000 tons, apparently the assumed capacity in steel products for sale. The 78.4 per cent is not applicable to ingots. If it were divided into the 18,898,697 tons of ingots produced it would bring out 24,200,000 tons as the apparent capacity. This chance to be 43 per cent of the 56,000,000 tons recently set forth by the American Iron and Steel Institute as the "theoretical capacity" of the country. This 43 per cent agrees with the proportion of ingots actually made by the corporation, but as a matter of fact it is known that the corporation rates its ingot capacity at considerably less. On its basis, therefore, it operated at a somewhat higher rate, in ingot making, than did the independents.

The corporation's increase in by-product coke manufacture is notable. Although 1925 was a year in which there was particular reason to fall back upon beehive ovens, only 20 per cent of its coke was thus made. The corporation's progress in ten years is shown by the following comparison, involving five-year intervals:

Steel Corporation Coke Production—Net Tons		
	Beehive	By-Product
1915.....	9,701,692	4,799,126
1920.....	6,125,032	10,083,079
1925.....	3,289,905	13,011,319

Metal Structure an Open Book

NEW evidence of the value of proper etching reagents and polishing methods in metallography is contained in a series of three articles just completed in THE IRON AGE this week. These developments, made public for the first time, include achievements hitherto thought impossible, and direct attention to some of the errors of work heretofore done. That polishing methods are quite as important as the etching solutions is also demonstrated.

Especially important are some of the structures which the new methods bring out. In the aluminum alloys the precipitates, which are regarded as the active agents in their age-hardening, have been clearly revealed for the first time. In the special copper alloys similar compounds of an entirely different composition have been brought out. Both of these seem to support the slip interference theory of hardness proposed by Jeffries and Archer. In the iron-chromium alloys some important constituents have been more clearly defined, and it has been possible to detect the slightest structural variations. The researches have also yielded information which promises to advance rapidly the commercial value of the chrome-iron alloys and the copper or "Corson" alloys.

The new methods accentuate the remarkable

progress in metallography. Twenty-five years ago the science was in its infancy. Then came the development work of Sauveur, Boylston and others. More recently Lucas has revealed the secrets of hitherto unresolvable crystal formations and grain boundaries by means of high-power photomicrography, calling attention only this year to the value of the violet ray in this work. At intervals have come new suggestions for etching and polishing, the most valuable being those of Vilella.

What with metallography, macrography and the X-ray it is a fair prophecy that nothing is hidden in metal structures that will not be brought into the light and read as highly dependable testimony to the properties of the material in service.

More Scrap in Steel Making

PIG iron production in 1925 by grades was published by the American Iron and Steel Institute this week, making it possible to compare output of steel making pig iron with that of steel. The same remarkably low proportion of pig iron appears for 1925 as was shown for 1924, less than two tons of basic and Bessemer iron being made to three tons of steel ingots and castings.

It was in 1911 that the total production of pig iron first fell below that of steel ingots and castings. This was a reflection partly of the increased use of scrap in steel making and partly of the failure of foundry and malleable pig iron production to keep pace with the growth of steel.

In THE IRON AGE of March 27, 1924, a table was given showing production of steel ingots and castings, 1912 to 1923 inclusive, also production of Bessemer and basic pig iron. An irregular decline in the proportion of pig iron was shown. The two years that have since elapsed have shown figures of their own. For a convenient comparison the 12 years may be divided into four-year periods, to eliminate temporary variations, whereupon a steady decrease in the proportion of pig iron is shown, thus:

Tons of Bessemer and Basic Pig Iron Produced
Per 100 Tons of Steel Ingots and Castings

1912-1915.....	74.8
1916-1919.....	71.6
1920-1923.....	66.7
1924-1925.....	63.9

From the first four-year period to the next the drop was 3.2 points; then there was a drop of 4.9 points, and finally, in what amounts to a three-year instead of a four-year interval there was a drop of 2.8 points. In 1924 the proportion was 63.7 per cent and in 1925, 64 per cent. A lower proportion was shown only in 1922, when the coal and coke strike caused a thorough cleaning up of stocks of scrap and pig iron, resulting in a proportion of 60.9 per cent.

The consumption of scrap may be estimated roughly by deducting the pig iron production from the steel production, on the assumption that ore additions approximately make up for weight losses. In the past two years, then, the consumption of scrap in making steel ingots and castings has run about 15,000,000 tons a year.

By no means is the bulk of this tonnage old

material. By far the greater portion is works scrap, much of it ingot and other crops, while a considerable tonnage of industrial scrap is produced in fabricating or working up steel. Probably ingot cropping has increased a trifle in the past ten years. This does not mean that sounder ingots are not being produced than those of 10 or 15 years ago. Requirements of steel buyers have become more exacting and the ingots of a dozen years ago, if made now, would probably have to be cropped more freely. The supply of old material is not running short, or mills would offer more than they do for what is available. The mills supply themselves with scrap and their customers with better steel by one and the same procedure.

Workmen's Compensation Agitations

REPRESENTATIVES of labor unions and politicians who specialize in labor measures are constantly trying to substitute a State workmen's compensation insurance fund for the common practice in industry of carrying insurance against loss by accidents. They have been successful in a few States. Just now they are making a determined effort to get Massachusetts to adopt what is known as the Ohio plan. The law in Ohio prohibits insurance in either mutual or stock companies and compels all compensation insurance through the State fund, with the important exception that self-insurance, under government supervision, is permitted.

Self-insurance is held to be good practice for the very large employers of labor. For instance, the American Steel & Wire Co. carries its own workmen's compensation insurance in Ohio, and, it is said, undoubtedly would do so in Massachusetts were it permitted. But this phase of the law is of small importance to the average employer, the number of whose workers is not great enough to make self-insurance practicable. In fact, it might work to his financial hurt.

Manufacturers do not welcome a State fund through which all of this class of insurance must pass. It might work well, they say, and then again it might not. A State department may become enmeshed in politics. Its economical administration cannot be assured. There is question of the claim that State fund insurance would be cheaper than that offered by mutual companies. And what applies to the mutuals, in which policyholders are the beneficiaries of any profits, applies, opponents of the State fund argue, with equal force to the stock companies which, as competitors of the mutuals, must make their costs to insurers reasonable. Both are subject to the mandates of the State insurance authorities, who are backed up by well-defined restrictive laws.

The States vary greatly in their compensation laws. Massachusetts permits no self-insurance and compensation insurance is almost exclusively through the companies. Ohio permits no insurance company to do business within its borders. New York has a State fund, denies self-insurance, and the insurance companies are permitted to compete with the State. A few of the larger employers of labor in Massachusetts would like to try self-insurance; their experience as to accidents leads them

to believe they would save money. The great majority, too small for self-insurance, are fighting the State fund. They believe it would be a step in the wrong direction. Moreover, the bill as presented to the legislature makes still more burdensome the financial responsibility on industrial owners.

Workmen's compensation has been constantly extended in its benefits to injured workers and their dependents ever since the system was transplanted to the United States from Great Britain, some 20 years ago. The uncompensated period following an accident has been shortened until it approaches nothing at all. The percentage of wage paid as compensation has been raised; doctor and hospital allowances have been made higher and cover a broader scope. Occupational diseases have been added as injuries for which compensation must be paid. Probably the worker injured in his employment gets no more than is just. But there is a limit, employers point out. The labor unions constantly insist that this limit has not been reached. Therefore those who must pay the bills for compensation must practice unending vigilance while legislatures are in session.

CHRONIUM has often been called the "key metal." Its importance to steel making and to industry in general is growing apace. Over 149,700 gross tons of chrome ore came into the United States last year, or 26 per cent more than the 118,300 tons received in 1924. Increased steel production in 1925 does not account in full for these larger receipts. The quantity of chromium alloy per ton of steel made has undoubtedly increased. So also has the proportion used in chrome-iron and other special alloys, the industrial application for which is rapidly enlarging. The unfortunate fact is our large dependence on foreign supplies. Only 157 tons of chromite came from domestic mines last year and only 233 tons in 1924—both years of large demand for alloy steels. The situation is similar to that in manganese and tin—a great industry almost solely dependent on foreign supplies. A saving factor is that Cuba furnished nearly 20 per cent of last year's total imports. The bulk came from Africa and Greece. In the near future the enlarged production of rustless iron will draw deeply on chromium supplies now being used in alloy steels, in special alloys, in refractories and in the chemical industry.

BUSINESS should not be unduly concerned over the stock market collapse. The country's industrial activities in the past two years did not warrant the high levels to which security values were lifted. It is fair to say, therefore, that the sharp decline in Wall Street that in less than two months has wiped out three-eighths of all the advance in security prices in the two-year period does not point to a like recession in business. Seeing that the stock market's reckless skyrocketing of values did not forecast a boom in business, its equally precipitous slump should not turn to pessimism the attitude of unruffled conservatism which the business community has held in an admirable way for many months.

FABRICATED STEEL

Awards 20,000 Tons and New Projects 31,000, Including 10,000-Ton Building in New York

Structural steel awards in the past week were slightly in excess of 20,000 tons. New projects up for bids total more than 31,000 tons, including 10,000 tons for an office building at Broadway and Barclay Street, New York. Awards follow:

NEW YORK, 3844 tons, reported by the Structural Steel Board of Trade, awarded as follows: Bank building at Broadway and Summer Street, Brooklyn, to Taylor-Fichter Steel Construction Co.; theater and store at New Rochelle, N. Y., to Harris Structural Steel Co.; telephone building in Jersey City to Eidlitz & Ross; apartment hotel at 48-56 West Seventy-second Street to Easton Structural Steel Co.; factory at Pierpont, N. Y., for Robert Gair Co., to Van Brunt Iron Works; St. Aedans Convent, Jersey City, to Selbach-Meyer Co.; parochial school in Greenpoint section of Brooklyn to Reliance Steel Fabricators; loft building at 48-50 West Fourth Street to Atlantic Structural Steel Co.; theater at New Rochelle, N. Y., to Owego Bridge Co.; hotel at 148-150 West Fifty-eighth Street to Easton Structural Steel Co.

NEW YORK, 500 tons, loft building on Fulton Street, to Paterson Bridge Co.

BALTIMORE, 300 tons, oil tank for Mexican Petroleum Corporation, to Chicago Bridge & Iron Works.

MIDDLETOWN, CONN., 300 tons, library at Wesleyan University, to Lehigh Structural Steel Co.

STAMFORD, CONN., 1000 tons, 1,500,000 cu. ft. gas holder for Stamford Gas & Electric Co., to Stacey Mfg. Co., Cincinnati.

FOXBORO, MASS., 170 tons, hospital addition, to New England Structural Co.

WATERTOWN, MASS., 300 tons, American Soda Fountain Co. plant, to Boston Bridge Works.

EASTON, PA., 650 tons, addition to First National Bank Building, to Bethlehem Construction Co.

SHARON, PA., 450 tons, boiler house and sheet mill extensions, Sharon Steel Hoop Co., to Pittsburgh Bridge & Iron Works.

LEBANON, PA., 150 tons, garage for Filbert-Ives Motors, Inc., to Bethlehem Construction Co.

PHILADELPHIA, 130 tons, mill building for Link-Belt Co., to American Steel Fabricators.

CLEVELAND, 400 tons, Nickel Plate railroad, bridge at Erie Pa., to American Bridge Co.

NORTH CAROLINA, 150 tons, storage tank and 50,000 cu. ft. gas holder at Burlington and a purifying box at Greensboro, to Stacey Mfg. Co.

CINCINNATI, 200 tons, Jewish Synagogue, to Oregonia Bridge Co., Lebanon, Ohio.

CINCINNATI, 100 tons, two storage tanks for Ault & Wiborg Co., to Stacey Mfg. Co.

COLUMBUS, OHIO, 1600 tons, Buckeye Savings & Loan Co., to Jones & Laughlin Steel Corporation.

ASHLAND, KY., 400 tons, warehouse for American Rolling Mill Co., to International Derrick & Equipment Co., Columbus, Ohio.

PADUCAH, KY., 4000 tons, Illinois Central repair shop, to American Bridge Co.

STEELING, ILL., 500 tons, 500,000-cu. ft. gas holder for Illinois Northern Utility Co., to Stacey Mfg. Co.

CHICAGO, 1100 tons, Midwest Athletic Club, to Midland Structural Steel Co., Chicago.

INDIANA, 300 tons, State highway bridges, to Rochester Bridge Co., Rochester, Ind.

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY, 170 tons, bridges, to Wisconsin Bridge & Iron Co.

MISSOURI PACIFIC RAILROAD, 750 tons, bridges, to Mount Vernon Bridge Co. and Virginia Bridge & Iron Co.

MILWAUKEE, 300 tons, addition, Oswald Jaeger Baking Co., to Milwaukee Structural Steel Co.; McCormick Co., New York, engineer.

OAKLAND, CAL., 300 tons, repairs to estuary bridge, to Moore Dry Dock Co.

OAKLAND, 300 tons, San Leandro high school, to Pacific Coast Engineering Co.

SILTZ BAY, WASH., 175 tons, bridge, to Moore Dry Dock Co.

SEATTLE, WASH., 350 tons, water tank for the city, to Puget Sound Machinery Depot.

SEATTLE, 375 tons, Pacific Telephone & Telegraph Co. building, to Hofsus Steel & Equipment Co., Seattle.

SNOHOMISH COUNTY, WASH., 100 tons, 170-ft. through riveted girder span, to Hofsus Steel & Equipment Co.

YOKOHAMA, JAPAN, 1000 tons, sponge iron plant for Gora Matsakata, to Worden-Allen Co.; Thornhill & Anderson, engineers.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

NEW YORK, 10,000 tons, office building at Broadway and Barclay Street.

NEW YORK, 600 tons, loft building on East Fifty-sixth Street.

PHILADELPHIA, 100 tons, sewage disposal plant.

PHILADELPHIA, 400 tons, Reading Railroad office building; general contract awarded to Irwin & Leighton.

HAZLETON, PA., 500 tons, high school building.

DOWNINGTOWN, PA., 115 tons, crane runway for the Downingtown Iron Works.

WESTFIELD, MASS., 300 tons, machine shop.

BOSTON, 300 tons, American Trust Co. addition.

KINGSLAND, GA., 400 tons, bridge for the Seaboard Air Line.

BALTIMORE & OHIO RAILROAD, 800 tons, three bridges.

SOUTHERN RAILWAY, 200 tons, two bridges.

PITTSBURGH, 600 tons, Insurance Exchange Building.

DAYTON, OHIO, 175 tons, building for Rudolph Wurlitzer Co.; bids opened.

AKRON, OHIO, 400 tons, addition to Portage Hotel.

CLEVELAND, 2000 tons, addition to public auditorium.

CLEVELAND, 200 tons, Brooklyn Masonic Temple.

CHICAGO, 1200 tons, dance hall on Milwaukee Avenue.

CHICAGO, 2000 tons, Chatelaine Hotel.

EAST CHICAGO, IND., 6000 tons, oil tankage for Roxana Petroleum Corporation.

INDIANA, 700 tons, two highway bridges.

PUEBLO, COLO., 2500 tons, mill buildings for Colorado Fuel & Iron Co.

ARKANSAS, 800 tons, oil tankage.

THE DALLES, ORE., 500 tons, pipe line; original bids rejected, new bids opened March 23.

SPOKANE, WASH., 320 tons, pipe line; opening of bids April 1.

JAPAN, 1400 tons, gas holder.

RAILROAD EQUIPMENT

Northern Pacific Orders 1000 Automobile Cars But Other Buying Is Negligible

The only business of importance in the railroad equipment field during the week was the buying of 1000 automobile cars by the Northern Pacific. There are inquiries for a few hundred cars. Thirteen locomotives were bought. The principal items of the week follow:

The Detroit & Toledo Short Line Railroad is inquiring for 6 locomotives.

The Canadian Pacific Railway has announced its equipment program for 1926. President Beatty advises shareholders that they will be asked to authorize the expenditure of approximately \$14,794,640 this year for equipment as follows: 11 baggage cars, 24 first-class cars, 8 buffet parlor cars, 10 tourist cars, 54 sleeping cars, 9 compartment cars, 11 compartment-observation cars, 1064 freight cars and work units and 44 locomotives. Authorization will also be given for other work aggregating nearly \$5,000,000, of which over \$1,250,000 is for rail replacement.

The Baltimore & Ohio is inquiring for 100 steel underframes for caboose cars and 16 air dump cars.

The International Railways of Central America are inquiring for 200 box cars.

The Siam State Railways have taken bids on 150 all steel "goods" wagons.

The Anglo Chilean Consolidated Nitrate Corporation is in the market for 140 gondola cars.

The Chicago & Northwestern has contracted with the American Car & Foundry Co. for the repair of 10 to 25 baggage cars.

The Chicago, Rock Island & Pacific has ordered 5 steel baggage cars from the American Car & Foundry Co.

The Northern Pacific placed 500 50-ft., 50-ton automobile cars with the Pressed Steel Car Co. and a like number with the Standard Steel Car Co.

The Missouri Pacific is in the market for 4 air dump cars.

The Mogiana Railway of Brazil has ordered 8 Mikado type locomotives and 2 Pacific type locomotives from the American Locomotive Co. Other orders received by the American Locomotive Co. include 1 oil electric locomotive from the Reading Co., 1 Mogul type locomotive from the Aluminum Co. of Canada, and 1 2-4-2-T type locomotive from the Brazilian Portland Cement Co. of Brazil.

Iron and Steel Markets

Pig Iron Increase of 6 Per Cent

Gain of 10 Furnaces in March—Noteworthy Steadiness of
Steel Prices and Mill Schedules—Sheet Mill
Wage Questions Pending

IN a week in which the securities market has raised anew the question how far its continued declines are a forecast of the course of business later in the year, the steel trade has repeated with little variation its performance of recent weeks. There is little surprise, indeed, that the rate of new buying in the final week of March still showed the gain over February that had been reported in the three preceding weeks.

The fact is that some consumers have been delaying purchases to the point of being unable to get deliveries when wanted. Hence the entire absence of one feature of old-time stock market declines—cancellations and postponed deliveries of steel bought on time contracts. Interest has centered in the continued high production of steel, in view of predicted falling off in some lines of consumption and of the exceptional rate of the Steel Corporation's activities, which for a part of the week has been at 100 per cent of practical capacity.

Pig iron output in March was the largest in twelve months. Estimates by wire from furnace companies which produced 92 per cent of the total in February indicate that approximately 3,430,000 tons was made in March. This is at the rate of 110,640 tons a day and compares with 2,923,415 tons in February, or 104,408 tons a day.

More blast furnaces went in in February and the number active on April 1 is estimated at 236, against 226 on March 1, a gain of 10, of which 4 were Bethlehem Steel Co. furnaces.

While March output of steel ingots may have established a new record, the March pig iron output, taken at the estimate of 3,430,000 tons, falls below that of March in each of the three preceding years, the total for March, 1925, being 3,564,247 tons, against 3,466,086 tons in 1924 and 3,523,868 tons in 1923.

The falling off this year, more than half of it in the Steel Corporation's total, confirms what has been pointed out previously—that the overproduction noticed in the first quarter of 1925, 1924 and 1923 was not repeated this year.

The recent steadiness of most finished steel prices has been noteworthy. Plates, which have been repeatedly a synonym of weakness, have been stronger throughout March, and the 1.90c. Pittsburgh price is now more general than at any time since Jan. 1.

Seeing that orders have been coming in for weeks in volume sufficient to maintain mill schedules, producers are disposed to think less of unfilled tonnage as a barometer of consumption. However, it is believed that April and May will be more conclusive on that point than February and March have been.

Demand for an upward adjustment of sheet mill wages—hardly a price-weakening factor—is

looked for with the meeting next week of the union organization in Pittsburgh. The sliding scale agreement based on sheet prices has developed some dissatisfaction, seeing that general iron and steel labor has been stationary for over two years, while the sheet-mill scale has followed the declining sheet market.

An index of the activity among iron and steel consumers is given by the employment figures for February of the National Metal Trades Association. The number of employees reported for that month, 652,844, was the largest in five months. Gains were recorded for all sections, with Detroit showing the greatest increase over January.

The Northern Pacific Railroad has ordered 1000 automobile cars.

The Ford Motor Co. bought 300,000 tons of Lake Superior ore for this year's delivery, and a Pittsburgh steel interest covered for 150,000 tons.

Bids for 3800 tons of 60-lb. rails for the Hambi Railroad, Japan, brought American and Continental quotations figuring back to \$29 a ton at mill, or the £6 price understood to have been set by the revived International Rail Makers Association.

Some 5300 tons of cast iron pipe for Barranquilla, Colombia, after being offered in turn to the Gelsenkirchen and Pont-a-Mousson works, has been ordered of the United States Cast Iron Pipe & Foundry Co.

February production of malleable castings was the largest in more than a year, except for January and last October.

THE IRON AGE composite price for finished steel is slightly higher at 2.439c. per lb., after standing at 2.431c., for four weeks.

Pittsburgh

Demand Sustained But Insufficient to
Build Backlogs—Prices Firm

PITTSBURGH, March 30.—Excepting the automobile builders, there continues to be a sustained demand from the important steel consuming industries. While buying still is of the short range character that makes it impossible for the steel manufacturers to accumulate backlogs and to lengthen their rolling mill schedules, there is no sign of a recession in steel works and rolling mill operations. The automobile industry still is providing a very fair amount of tonnage because curtailment of production is on the part of the few, rather than the many, and comes as a result of the fact that some makers of popular priced cars were a little too optimistic in production and unfavorable weather defeated their sales expectations. Local reports have one company that was scheduled at 1700 cars a day in March as being down to 1100 cars a day for April. It is evident that there is no desire among motor car builders to produce too far in excess of orders.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

For Early Delivery

Pig Iron, Per Gross Ton:	Mar. 30, 1926	Mar. 23, 1926	Mar. 2, 1926	Mar. 31, 1925
No. 2X, Philadelphia...	\$23.26	\$23.26	\$23.76	\$23.26
No. 2, Valley Furnace...	20.50	20.50	20.50	21.00
No. 2, Southern, Cin'ti...	25.69	25.69	25.69	24.05
No. 2, Birmingham, Ala.†	22.00	22.00	22.00	20.00
No. 2 foundry, Chicago*	23.00	23.00	23.00	23.00
Basic, del'd, eastern Pa.	21.75	21.75	23.00	22.75
Basic, Valley furnace...	20.00	20.00	20.00	21.00
Valley Bessemer del. P'gh.	22.76	22.76	22.76	23.76
Malleable, Chicago*	23.00	23.00	23.00	23.00
Malleable, Valley	20.50	20.50	20.50	21.50
Gray forge, Pittsburgh...	21.76	21.76	21.76	22.26
L. S. charcoal, Chicago...	29.04	29.04	29.04	29.04
Ferromanganese, furnace...	88.00	90.00	115.00	115.00

Rails, Billets, Etc., Per Gross Ton:	Mar. 30, 1926	Mar. 23, 1926	Mar. 2, 1926	Mar. 31, 1925
O.-h. rails, heavy, at mill...	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill...	34.00	35.00	35.00	40.32
Bess. billets, Pittsburgh...	35.00	35.00	35.00	35.50
O.-h. billets, Pittsburgh...	35.00	35.00	35.00	35.50
O.-h. sheet bars, P'gh.	36.00	36.00	36.00	37.00
Forging bil'ts, base, P'gh.	40.00	40.00	40.00	41.00
O.-h. billets, Phila.	40.30	40.30	40.30	41.67
Wire rods, Pittsburgh...	45.00	45.00	45.00	48.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	1.90	1.90	1.90	2.10

Finished Iron and Steel,	Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.22	2.22	2.22	2.28	
Iron bars, Chicago	2.00	2.00	2.00	2.10	
Steel bars, Pittsburgh...	2.00	2.00	2.00	2.10	
Steel bars, Chicago	2.10	2.10	2.10	2.20	
Steel bars, New York...	2.34	2.34	2.34	2.44	
Tank plates, Pittsburgh...	1.90	1.85	1.85	2.00	
Tank plates, Chicago	2.10	2.10	2.10	2.30	
Tank plates, New York...	2.24	2.14	2.14	2.34	
Beams, Pittsburgh	1.90	1.90	1.90	2.10	
Beams, Chicago	2.10	2.10	2.10	2.30	
Beams, New York	2.24	2.24	2.24	2.34	
Steel hoops, Pittsburgh...	2.50	2.50	2.50	2.40	

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire,	Mar. 30, 1926	Mar. 23, 1926	Mar. 2, 1926	Mar. 31, 1925
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	3.25	3.25	3.25	3.40
Sheets, black, No. 28, Chi-				
cago dist. mill.	3.45	3.45	3.45	3.60
Sheets, galv., No. 28, P'gh.	4.50	4.50	4.50	4.50
Sheets, galv., No. 28, Chi-				
cago dist. mill.	4.70	4.70	4.70	4.70
Sheets, blue, 9 & 10, P'gh.	2.50	2.50	2.50	2.65
Sheets, blue, 9 & 10, Chi-				
cago dist. mill.	2.60	2.60	2.60	2.70
Wire nails, Pittsburgh...	2.65	2.65	2.65	2.85
Wire nails, Chicago dist.				
mill	2.70	2.70	2.70	2.95
Plain wire, Pittsburgh...	2.50	2.50	2.50	2.60
Plain wire, Chicago dist.				
mill	2.55	2.55	2.55	2.70
Barbed wire, galv., P'gh.	3.35	3.35	3.35	3.55
Barbed wire, galv., Chicago				
dist. mill	3.40	3.40	3.40	3.65
Tin plate, 100 lb. box, P'gh.	\$5.50	\$5.50	\$5.50	\$5.50

Old Material, Per Gross Ton:	Mar. 30, 1926	Mar. 23, 1926	Mar. 2, 1926	Mar. 31, 1925
Carwheels, Chicago	\$17.00	\$17.00	\$17.00	\$16.00
Carwheels, Philadelphia	17.50	17.50	17.50	18.00
Heavy steel scrap, P'gh.	17.00	17.50	17.50	18.00
Heavy steel scrap, Phila.	16.50	16.50	15.50	15.50
Heavy steel scrap, Ch'go.	14.00	14.00	13.75	15.50
No. 1 cast, Pittsburgh	17.00	17.00	17.00	18.00
No. 1 cast, Philadelphia	17.50	17.50	17.50	18.00
No. 1 cast, Ch'go (net ton)	17.00	17.00	17.00	17.50
No. 1 RR. wrot. Phila.	17.50	17.00	17.50	18.50
No. 1 RR. wrot. Ch'go (net)	13.00	13.00	12.75	13.50

Coke, Connellsville, Per Net Ton at Oven:	Mar. 30, 1926	Mar. 23, 1926	Mar. 2, 1926	Mar. 31, 1925
Furnace coke, prompt...	\$3.00	\$3.00	\$3.00	\$3.25
Foundry coke, prompt...	4.25	4.25	4.50	4.00

Metals,	Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	14.12 1/2	14.25	14.37 1/2	13.75	
Electrolytic copper, refinery	13.62 1/2	13.87 1/2	13.87 1/2	13.25	
Zinc, St. Louis	7.10	7.42 1/2	7.35	7.00	
Zinc, New York	7.45	7.77 1/2	7.70	7.35	
Lead, St. Louis	8.00	8.10	8.60	8.12 1/2	
Lead, New York	8.37 1/2	8.37 1/2	8.90	8.45	
Tin (Strait), New York	62.87 1/2	65.00	64.00	62.37 1/2	
Antimony (Asiatic), N. Y.	19.25	20.50	20.50	14.00	

THE IRON AGE Composite Prices

Finished Steel

March 30, 1926, 2.439c. Per Lb.

One week ago	2.431c.
One month ago	2.431c.
One year ago	2.531c.
10-year pre-war average	1.689c.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.

	High		Low	
1926	2.453c.	Jan. 6;	2.424c.	Feb. 9
1925	2.560c.	Jan. 6;	2.396c.	Aug. 18
1924	2.789c.	Jan. 15;	2.460c.	Oct. 14
1923	2.824c.	April 24;	2.446c.	Jan. 2

Pig Iron

March 30, 1926, \$21.38 Per Gross Ton

One week ago	\$21.38
One month ago	21.46
One year ago	21.54
10-year pre-war average	15.72

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.

	High		Low	
1926	\$21.54,	Jan. 6;	\$21.38,	March 9
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	March 20;	20.77,	Nov. 20

Wire products are moving with more freedom than was the case recently. There is no abatement in production or shipments of tin plate and there is a steady, though gradual, increase in the sale of tubular goods.

The remarkable feature of the steel market is the steadiness of prices. If there is ever a time when the temptation is strong to cut prices, it is when backlogs are light and schedules short. But this condition has been such a common one over the past two years that manufacturers now seem to have adjusted themselves to it and seem to be guided by an idea that just as much business will come out at sustained prices as at concessions. Sales effort necessarily has to be strong and persistent to keep orders flowing in to keep the mills running, but this effort usually is accompanied by firm price ideas, and in the heavy tonnage products

practically all mills are disposed to seek higher prices because it is felt that recent prices have been too low.

Pig iron producers also seem to be animated by a desire for a fair profit, because in the face of a very dull market, which has ruled now since late last year, they still are adhering to the prices reached last November. The market for blast furnace coke has become well balanced as to supply and demand and well defined as to prices. The scrap market is sagging because of the lack of interest on the part of melters.

Pig Iron.—There has been no increase in demand, and sales, which run mostly to foundry iron, have been chiefly of lots of 50 to 100 tons. Buyers are satisfied that with this year's ore at the same price it was last year and coke roughly about 70c. a ton lower for the second quarter than on first quarter tonnages, there

is not much danger of higher prices for pig iron, and those who may need supplies for second quarter seem disposed to wait the market out. Producers, however, regard present prices as low enough if they are to have a fair profit and are not disposed to force sales, since to do so would mean concessions. Steel companies in this district which ordinarily have some surplus iron do not seem to be pressing it for sale and regular production of merchant iron does not appear to be creating any burdensome accumulations in first hands.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic	\$20.00
Bessemer	21.00
Gray forge	20.00
No. 2 foundry	20.50
No. 3 foundry	20.00
Malleable	20.50
Low phosphorus, copper free....	\$28.00 to 28.50

Steel and Iron Bars.—Price ideas of makers of steel bars in this district have undergone some stiffening since a week ago and the effort to establish 2.10c., base, Pittsburgh, on small tonnages is a stronger and more general one. The market on ordinary tonnages, however, still is quotable at 2c. to 2.10c., base, and buyers who can provide orders for 400 or 500 tons for second quarter delivery as a rule are finding accommodation at the lower figure. The bar iron market is steady both as to demand and prices.

Structural Material.—Mills here are somewhat stronger in their prices and while the quotable range is the same as a week ago, it is taking somewhat larger tonnages than recently to get the lower quotation. This district is not providing much fabricated steel work, although it is estimated that close to 20,000 tons will be required for projects pending or on the architects' drawing boards. Prices are given on page 943.

Plates.—Eastern mill competition in prices appears to have lessened considerably in the past few weeks, and local mills now are generally quoting 1.90c., base, Pittsburgh, and indicating little interest in the general run of orders at less than that price. Business on mill books and pending is not particularly heavy but makers seem to regard prices of less than 1.90c., base, as too low on the basis of costs.

Bolts, Nuts and Rivets.—Specifications against bolt and nut contracts are quite steady and with a fair amount of new business. Makers in this district profess satisfaction over business. Prices are holding very steady at levels established fifteen months ago. Most makers of large rivets are holding to \$2.60 base, per 100 lb., but a few manufacturers still are shading that price and making a rather steep cut on sizable orders or those sizes that carry rather large extras. Prices and discounts are given on page 943.

Warehouse Business.—Business in plates, shapes and bars in this district has tapered off somewhat in the past week, but March as a whole has proved fairly satisfactory month. The movement of wire products from jobbers' stocks is somewhat better than it has been, due to spring demands.

Ferroalloys.—One domestic maker of ferromanganese and the importer of Norwegian material have further reduced the price and now are quoting \$88, Atlantic seaboard. Another domestic producer seems to have withdrawn from the market after it broke through \$95, but having contracts that guaranteed buyers against a decline, it has been obliged to revise prices on much of its business to the new levels. Meanwhile the quotations on British and German ferromanganese remain at \$110, c.i.f. Atlantic seaboard, duty paid. There are reports that British producers might attempt to win back some of the market lost in this country recently as a result of the cut in prices by domestic producers, but to do so at a profit would be possible only through a decided drop in the prices of Indian and Brazilian ores on which British producers are now chiefly dependent. Lower prices for Indian ore would entail a cut in wages in India, and it is doubtful if the British government would sanction a step that might make an unfavorable political situation worse. Moreover, there are few American consumers of ferromanganese who have failed to secure full coverage against this year's re-

quirements. There is a steady flow of specifications against contracts for spiegeleisen and the higher grades of ferrosilicon. Prices are given on page 945.

Semi-Finished Steel.—Most of the non-integrated steel makers have closed with regular sources of supply for their second quarter requirements of billets, slabs and sheet bars, and the best information is that the first quarter prices were continued. Actual tonnages for the second quarter are probably smaller than for the first quarter because deliveries on first quarter contracts will run over into April in many instances. The ruling prices on first quarter contracts were \$35, Pittsburgh or Youngstown, for large billets and slabs, and \$36 for sheet bars and small billets and slabs. Forging quality steel continues at a premium of \$5 per ton over rolling quality. Wire rods are steady at recent prices with a persistent, if moderate, demand. The quotation on skelp is nominal, as there is not much business except on contracts. Prices are given on page 945.

Wire Products.—Business in the past week has been heavier with most producers. With spring at hand and consumption on the increase, it is natural that the mills should be called on for larger shipments, since by pursuing a cautious policy over the past few months, the jobbers have not built up their stocks. Another factor in the larger demands, notably for nails, is that jobbers have had the option of ordering out by March 31, unspecified tonnages carrying favorable prices. All makers are holding firmly to \$2.65, base per keg, for nails and \$2.50, base per 100 lb., for plain wire. Other prices are given on page 943.

Rails.—Not much new business is coming out in standard sections and accessories, but makers in this district are fairly well off in point of bookings, and specifications are being made steadily. Prices are holding well on those lines, but there still is uncertainty as to prices of light rails. On billet light rails \$35 per gross ton now appears to be all that can be secured even for small lots. Prices are given on page 943.

Tubular Goods.—The general demand for pipe is not so great as to impose a tax upon productive capacity, but as the weather grows more favorable, there is a steady expansion in consumption and consequently in the demands upon the mills. Recently there has been relatively better business in butt weld than lap weld sizes, but greater oil and gas well work will later bring up the demands for the latter. There are some line pipe inquiries, but no actual orders of consequence in the past week. Seamless steel tubes are in good demand, since railroads are reasonably good buyers of locomotive tubes and mechanical tubing is moving well to the automobile industry. Prices of lap weld steel and charcoal iron tubes seem steadier. On the latter, two tens beyond the card is now the common quotation, and only on especially attractive business is it possible to get more than an extra 5 per cent. Discounts are given on page 943.

Sheets.—Users are not showing much disposition to buy beyond their actual and nearby requirements, but these requirements are fairly sizable in view of the fact that specifications and orders reach larger totals than in recent weeks. The American Sheet & Tin Plate Co. last week had the largest orders and specifications of any one week in more than a month. This indicates both a reasonably good business and price maintenance, since other companies, if not getting a fair business, would be providing more competition. There still are price deviations, but as a general rule in this territory, 4.60c., base, for galvanized and 2.50c., base, for blue annealed are well observed. Little change is observed in mill operations, but if there is a definite tendency it is down, as old business is being completed more rapidly than new orders are coming in. Prices are given on page 943.

Tin Plate.—Container manufacturers continue to specify against contracts and to take shipments freely, and the high rate of mill operation noted since late last year continues. New business is light, but there are few important consumers who do not pursue the contract method of purchase.

Prices of Finished Iron and Steel Products (Carload Lots)

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills.....	2.00c. to 2.10c.
F.o.b. Chicago	2.10c.
Del'd Philadelphia	2.32c.
Del'd New York	2.34c. to 2.44c.
Del'd Cleveland	2.19c.
F.o.b. Birmingham	2.15c. to 2.25c.
C.I.f. Pacific ports	2.35c.
F.o.b. San Francisco mills.....	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills.....	2.00c. to 2.10c.
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Rail Steel

F.o.b. mill	1.80c. to 1.90c.
F.o.b. Chicago	2.00c.

Iron

Common iron, f.o.b. Chicago.....	2.00c.
Refined iron, f.o.b. P'gh mills.....	3.00c.
Common iron, del'd Philadelphia.....	2.22c.
Common iron, del'd New York.....	2.24c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mill.....	1.90c.
F.o.b. Chicago	2.10c.
F.o.b. Birmingham	2.00c. to 2.05c.
Del'd Cleveland	2.09c.
Del'd Philadelphia	2.22c.
Del'd New York	2.24c.
C.I.f. Pacific ports	2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mill.....	1.90c. to 2.00c.
F.o.b. Chicago	2.10c.
F.o.b. Birmingham	2.05c. to 2.15c.
Del'd Cleveland	2.09c. to 2.19c.
Del'd Philadelphia	2.12c. to 2.22c.
Del'd New York	2.24c. to 2.34c.
C.I.f. Pacific ports	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh.....	2.50c.
All gages, 6 in. and wider, P'gh.....	2.30c.
All gages, 6 in. and narrower, Chicago.....	2.60c.
All gages, wider than 6 in., Chicago.....	2.50c.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills.....	2.50c.
Bars, f.o.b. Chicago	2.50c.
Bars, Cleveland	2.55c.
Shafting, ground, f.o.b. mill.....	*2.70c. to 3.00c.
Strips, f.o.b. Pittsburgh mills.....	3.90c.
Strips, f.o.b. Cleveland mills	3.90c.
Strips, delivered Chicago	4.20c.
Strips, f.o.b. Worcester mills	4.05c.

*According to size.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	\$2.65
Galv'd nails, 1-in. and longer.....	4.65
Galv'd nails, shorter than 1 in.....	4.90
Galvanized staples	3.35
Polished staples	3.10
Cement coated nails	2.65

	Base Per 100 Lb.
Bright plain wire, No. 9 gage.....	\$2.50
Annealed fence wire	2.65
Spring wire	3.50
Galv'd wire, No. 9	3.10
Barbed wire, galv'd	3.35
Barbed wire, painted	3.10

Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mill \$3 a ton higher on production of that plant; Duluth, Minn., mill \$2 a ton higher; Anderson, Ind., \$1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh	\$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh.....	2.50c.
Nos. 9 and 10, f.o.b. Ch'go dist. mills.....	2.60c.
Nos. 9 and 10, del'd Phila'phia.....	2.32c.

Box Annealed, One Pass Cold Rolled

No. 28, f.o.b. Pittsburgh	3.25c. to 3.35c.
No. 28, f.o.b. Ch'go dist. mill	3.45c.
No. 28, del'd Phila'phia	3.67c.

Galvanized

No. 28, f.o.b. Pittsburgh.....	4.50c. to 4.60c.
No. 28, f.o.b. Chicago dist. mill.....	4.70c.
No. 28, del'd Philadelphia	4.92c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	3.25c. to 3.35c.
No. 28, f.o.b. Chicago dist. mill.....	3.45c.

Automobile Body Sheets

No. 22, f.o.b. Pittsburgh	4.40c.
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Long Ternes

No. 28, 8-lb. coating, f.o.b. mill.....	4.85c.
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Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills.....	\$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.	5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)
(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base.....	\$11.40	20-lb. coating I.C. \$16.20
8-lb. coating I.C. 11.70		25-lb. coating I.C. 17.90
15-lb. coating I.C. 14.85		30-lb. coating I.C. 19.45
		40-lb. coating I.C. 21.65

Alloy Steel Bars

(F.o.b. Pittsburgh or Chicago)

S. A. E. Series Numbers	Base Per 100 Lb.
2100* (½% Nickel, 0.10% to 0.20% Carbon)	\$3.20 to \$3.25
2300 (3½% Nickel)	4.50 to 4.60
2500 (5% Nickel)	5.70 to 5.80
3100 (Nickel Chromium)	3.50 to 3.60
3200 (Nickel Chromium)	5.00 to 5.25
3300 (Nickel Chromium)	7.00 to 7.25
3400 (Nickel Chromium)	6.25 to 6.50
5100 (Chromium Steel)	3.50
5200* (Chromium Steel)	7.00 to 7.50
6100 (Chrom. Vanadium bars).....	4.20 to 4.30
6100 (Chrom. Vanad. spring steel)	3.80
9250 (Silicon Manganese spring steel)	3.20 to 3.25
Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)	4.10 to 4.20
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.45 to 4.55
Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.25 to 4.35
Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.40 to 3.50
Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill	\$42.00
Light (from billets), f.o.b. mill.....	\$34.00 to 35.00
Light (from rail steel), f.o.b. mill.....	\$33.00 to 34.00
Light (from billets), f.o.b. Ch'go mill	36.00 to 38.00

Track Equipment

(F.o.b. Mill)

	Base Per 100 Lb.
Spikes, ½ in. and larger.....	\$2.80 to \$3.10
Spikes, ½ in. and smaller.....	3.00 to 3.50
Spikes, boat and barge.....	3.25
Track bolts, all sizes	4.00 to 4.50
Tie plates, steel	2.25 to 2.35
Angle bars	2.75

Welded Pipe

Base Discounts f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Inches	Steel Black	Galv.	Inches	Iron Black	Galv.
1/4 to 1/2	45	19 1/2	1/4 to 1/2	+11	+39
1/2 to 3/4	51	25 1/2	1/2 to 3/4	22	3
3/4 to 1	56	42 1/2	3/4 to 1	28	11
1 to 1 1/4	60	48 1/2	1 to 1 1/4	30	13
1 1/4 to 1 1/2	62	50 1/2			

Lap Weld

2	55	43 1/2	2	28	7
2 1/2 to 6	59	47 1/2	2 1/2 to 6	26	11
7 and 8	56	45 1/2	3 to 6	28	13
9 and 10	54	41 1/2	7 to 12	26	11
11 and 12	53	40 1/2			

Butt Weld, extra strong, plain ends

1/4 to 1/2	41	24 1/2	1/4 to 1/2	+10	+54
1/2 to 3/4	47	30 1/2	1/2 to 3/4	21	7
3/4 to 1	53	42 1/2	3/4 to 1	28	12
1 to 1 1/4	58	47 1/2	1 to 1 1/4	30	14
1 1/4 to 1 1/2	60	49 1/2			
2 to 3	61	50 1/2			

Lap Weld, extra strong, plain ends

2	53	42 1/2	2	28	9
2 1/2 to 4	57	46 1/2	2 1/2 to 4	29	15
4 1/2 to 6	56	45 1/2	4 1/2 to 6	28	14
7 to 8	52	39 1/2	7 to 8	21	7
9 and 10	45	32 1/2	9 to 12	16	2
11 and 12	44	31 1/2			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2½ in.....	27	1½ in.....	+13
2½ to 2¾ in... 37		1¾ to 1⅞ in... 3	
3 in..... 40		2 to 2¼ in..... 2	
3¾ to 3¾ in..... 42½		2¼ to 3 in..... 7	
4 to 13 in..... 46		3½ to 4½ in..... 9	

Beyond the above discounts, 5 to 7 fives extra are given on lap welded steel tubes and 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	46
1 1/4 to 1 1/2 in.....	52	3 1/4 to 3 1/2 in.....	47
1 1/2 in.	36	4 in.	50
2 to 2 1/4 in.....	31	4 1/2, 5 and 6 in.	45
2 1/4 to 2 3/4 in.....	39		

Hot Rolled

2 and 2 1/4 in.....	34	3 1/4 and 3 1/2 in.....	50
2 1/2 and 2 3/4 in.....	42	4 in.	53
3 in.	45	4 1/2, 5 and 6 in.....	48

Less carloads, 4 points less. Add \$5 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base.....	55
Carbon, 0.30% to 0.40%, base.....	50

Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

Cold-Finished Steel Bars and Shafting.—Reports as to business are somewhat mixed, but the general average is reflected in a local mill engagement of 70 to 75 per cent capacity. For some time important consumers have not been buying much ahead of actual requirements. Good observance of 2.50c., base Pittsburgh, on ordinary tonnages is noted.

Hot-Rolled Flats.—Mill scheduling is close, as backlogs are fairly well reduced and producers are often dependent on daily business to provide rollings. It is typical of the demand that just when it looks as though a mill might have to come off for want of orders, the necessary business to keep it going is received. Prices are holding despite the short schedules. They are given on page 943.

Cold-Rolled Strip.—Buying is at short range. Automobile builders have not yet made much of a cut in their production, but they seem to have made more cars than they have shipped and are watching raw material purchases closely. There are deviations from 3.90c., base Pittsburgh or Cleveland, but they are not very frequent.

Old Material.—Not much more than appraisal of scrap prices is possible, as there is no genuine interest in the market on the part of consumers and such business as is going on is in small tonnages, shipped to consumers without order, with a little dealer buying against old orders. On heavy melting steel, the market is now quotable at \$17 to \$17.50. No sizable tonnages could be bought at those prices, but no sizable tonnages are sought, since most consumers are content to "live" off the small lots currently offered. Producers of scrap are not offering much material at current levels. The American Steel & Wire Co. is taking bids on the dismantling of the old Edith furnace, Pittsburgh, long operated under lease by the Carnegie Steel Co. There is about 4000 tons of steel and iron scrap in the plant, but the sale will not include the pouring house, which is to be taken down and loaded for shipment to Chicago.

We quote for delivery to consumer's mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel.....	\$17.00 to \$17.50
No. 1 cast, cupola size	17.00 to 17.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	19.00 to 19.50
Compressed sheet steel	15.50 to 16.00
Bundled sheets, sides and ends..	14.50 to 15.00
Railroad knuckles and couplers..	20.00 to 20.50
Railroad coil and leaf springs...	20.00 to 20.50
Low phosphorus blooms and billet ends	22.00 to 22.50
Low phosphorus plates and other material	19.50 to 20.00
Low phosphorus punchings	19.50 to 20.00
Steel car axles	22.50 to 23.00
Cast iron wheels	18.00 to 18.50
Rolled steel wheels	20.00 to 20.50
Machine shop turnings	13.00 to 13.50
Short shoveling turnings	13.00 to 13.50
Sheet bar crops	20.00 to 20.50
Heavy steel axle turnings.....	16.00 to 16.50
Short mixed borings and turnings	13.00 to 13.50
Heavy breakable cast.....	15.00 to 15.50
Cast iron borings	13.00 to 13.50
No. 1 railroad wrought	12.50 to 13.00
No. 2 railroad wrought	17.00 to 17.50
Malleable scrap	17.50 to 18.00

Coke and Coal.—The coke market is steady. Connellsville production has become fairly well adjusted to contract requirements, and spot offerings no longer are running much in excess of demand. Furnaces in blast or likely to go in in the near future are covered

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Tank plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes.....	2.90c.
Reinforcing steel bars.....	2.90c.
Cold-finished shafting and screw stock—	
Round and hexagons	3.60c.
Square and flats.....	4.10c.
Bands	3.60c.
Spikes, large	3.30c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Bolts, track	4.90c.
Wire, black soft annealed, base per 100 lb..	\$3.00
Wire, galvanized soft, base per 100 lb.....	3.00
Common wire nails, per keg.....	3.00
Cement coated nails	3.05

against their second quarter coke requirements, and the ruling price on these tonnages appears to be \$3.25. The spot market for furnace coke is still quotable at \$3 to \$3.25. There is only a limited demand, but supplies also are moderate. Spot foundry coke holds at the price range of a week ago. There is practically no market for coal, and prices are largely buyers' valuations. Consumers who usually buy well ahead of their requirements have no fears about being able to get all they want when they want it, without bidding up prices on themselves. Prices are given on page 945.

REINFORCING STEEL

Awards Exceed 3600 Tons and Inquiries Covering New Projects Are 3500 Tons

Concrete reinforcing bar awards during the week, mostly in lots not exceeding a few hundred tons, totaled upward of 3600 tons. New projects in the market call for 3500 tons of bars. Awards follow:

- NEW YORK, 300 to 500 tons, foundation for building, Broadway and Vesey Street, to Jones & Laughlin Steel Corporation.
- NEW YORK, 200 tons, foundation, hotel, Fifty-fourth Street, to Jones & Laughlin Steel Corporation.
- NEW YORK, 200 tons, Hunt's Point plant, Consolidated Gas Co., 163d Street and East River, to McClintic-Marshall Co.
- JERSEY CITY, 100 tons, Hudson County jail, to Joseph T. Ryerson & Son.
- NEWARK, 100 tons, plant, Armitage Varnish Co., to McClintic-Marshall Co.
- STAMFORD, CONN., 100 tons, Glenbrook School, to Concrete Steel Co.
- ST. PETERSBURG, FLA., 620 tons, widening of Gandy Boulevard, to Gulf States Steel Co.
- PITTSBURGH, 600 tons, apartment hotel, Fifth Avenue near Craig Street, to Truscon Steel Co.
- PITTSBURGH, 225 tons, warehouse, H. J. Heinz Co., to Carlem Engineering Co., Pittsburgh.
- CHICAGO, 120 tons, Hyde Park Baptist Church, to Olney J. Dean & Co.
- CHICAGO, 100 tons, Illinois Central Randolph station, to Truscon Steel Co.
- CHICAGO, 100 tons, Christopher public school, to Concrete Engineering Co.
- MILWAUKEE, 100 tons rail steel, Packard garage, to Calumet Steel Co.
- MILWAUKEE, 450 tons rail steel, United States Engineer's office, to Calumet Steel Co.
- SALINE, KAN., 100 tons, Swift & Co., to Olney J. Dean & Co.
- ST. LOUIS, 100 tons, apartment house at Grand and Russell Avenues, to Laclede Steel Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

- CHICAGO, 300 tons, LaSalle Street bridge.
- CHICAGO, 300 tons, Eitel Building, State and Cass Streets.
- CHICAGO, 350 tons, Flamingo Hotel.
- CHICAGO, 455 tons, University of Chicago Stadium; E. L. Scheidenhem low bidder on general contract.
- CHICAGO, 200 tons, Phillip State Bank, Clark and Lunt Streets; H. D. Moreland, architect.
- CHICAGO, 400 tons, Sheridan-Aldine apartment building; Rissman & Hirschfeldt, architect.
- CHICAGO, 450 tons, apartment at Pearson and DeWitt Streets; Guske & Foster, architects.
- INDIANAPOLIS, IND., 700 tons, State road work.
- GARY, IND., 120 tons, additions to the Emerson, Tolleston and Lew Wallace public schools; Larsen & Danielson, La Porte, Ind., low bidders.
- ST. LOUIS, 200 tons, St. Louis Independent Packing Co.
- DENVER, COLO., 300 tons, United States Reclamation Service.
- MANSFIELD, OHIO, 190 tons, Richland Hotel.

The charcoal iron furnace of the Michigan Iron & Chemical Co., East Jordan, Mich., which has been out of blast for several months, will be blown in this week. Rogers, Brown & Crocker Brothers, Inc., have been appointed exclusive agents to sell its output.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rolling, 4-in. and over.....	\$35.00
Rolling, 2-in. and smaller.....	36.00
Forging, ordinary.....	40.00
Forging, guaranteed.....	45.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer.....	\$36.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger.....	\$35.00
6 in. x 2 in. and smaller.....	36.00

Skelp

	Per Lb.
Grooved.....	1.90c.
Sheared.....	1.90c.
Universal.....	1.90c.

Wire Rods

	Per Gross Ton
*Common soft, base, No. 5 to 1/2-in.....	\$45.00
Common soft, coarser than 1/2-in.....	\$2.50 over base
Screw stock.....	\$5.00 per ton over base
Carbon 0.20% to 0.40%.....	3.00 per ton over base
Carbon 0.41% to 0.55%.....	5.00 per ton over base
Carbon 0.56% to 0.75%.....	7.50 per ton over base
Carbon over 0.75%.....	10.00 per ton over base
Acid.....	15.00 per ton over base

*Chicago mill base is \$46. Cleveland mill base, \$45.

Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron.....	\$4.55
Old range non-Bessemer, 51.50% iron.....	4.40
Mesabi Bessemer, 51.50% iron.....	4.40
Mesabi non-Bessemer, 51.50% iron.....	4.25
High phosphorus, 51.50% iron.....	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian.....	9.50c. to 10c.
Iron ore, Swedish, average 66% iron.....	9.50c.
Manganese ore, washed, 51% manganese, from the Caucasus.....	45c.
Manganese ore, Brazilian or Indian, nominal.....	42c. to 44c.
Tungsten ore, high grade, per unit, in 60% concentrates.....	\$12.50 to \$14.00

Chrome ore, Indian basic, 48% Cr₂O₃, crude, c.i.f. Atlantic seaboard.....

	Per Lb.
Molybdenum ore, 85% concentrates of MoS ₃ , delivered.....	55c. to 60c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt.....	\$3.00 to \$3.25
Foundry, f.o.b. Connellsville prompt.....	4.25 to 4.75
Foundry, by-product, Ch'go ovens.....	10.50
Foundry, by-product, New England, del'd.....	13.00
Foundry, by-product, Newark or Jersey City, delivered.....	10.50 to 11.52
Foundry, Birmingham.....	6.50
Foundry, by-product, St. Louis or Granite City.....	10.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines.....	\$1.40 to \$1.90
Mine run coking coal, f.o.b. W. Pa. mines.....	1.65 to 1.90
Mine run gas coal, f.o.b. W. Pa. mines.....	1.90 to 2.10
Steam slack, f.o.b. W. Pa. mines.....	1.30 to 1.40
Gas slack, f.o.b. W. Pa. mines.....	1.40 to 1.50

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd.....	\$88.00 to \$90.00
Foreign, 80%, Atlantic or Gulf port, duty paid.....	\$88.00 to 110.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%.....	\$32.00 to \$34.00
Domestic, 16 to 19%.....	31.00 to 33.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%.....	\$85.00
75%.....	145.00
	Per Gross Ton Furnace
10%.....	\$42.00
11%.....	42.00
	Per Gross Ton Furnace
12%.....	\$42.00
14 to 16%.....	\$45 to 46.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton
10%.....	\$36.00
11%.....	38.00

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton
6%.....	\$28.50
7%.....	29.50
8%.....	30.50
9%.....	32.00
	Per Gross Ton
10%.....	\$34.00
11%.....	36.00
	Per Gross Ton
12%.....	38.00

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd.....	\$1.15 to \$1.20
Ferrochromium, 4% carbon and up, 60 to 70% Cr., per lb. contained Cr. delivered.....	1.50c.
Ferrovandium, per lb. contained vanadium, f.o.b. furnace.....	\$3.25 to \$4.00
Ferrocobaltitium, 15 to 18%, per net ton, f.o.b. furnace, in carloads.....	\$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton.....	\$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton.....	\$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines.....	\$17.00 to \$18.00
No. 2 lump, Illinois and Kentucky mines.....	\$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid.....	\$17.41 to \$18.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/4% silica, f.o.b. Illinois and Kentucky mines.....	\$32.50

Fire Clay

	Per 1000 f.o.b. Works
	High Duty
	Moderate Duty
Pennsylvania.....	\$43.00 to \$46.00
Maryland.....	48.00 to 50.00
Ohio.....	43.00 to 46.00
Kentucky.....	43.00 to 45.00
Illinois.....	43.00 to 45.00
Missouri.....	40.00 to 43.00
Ground fire clay, per ton.....	6.50 to 7.50

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania.....	\$40.00
Chicago.....	49.00
Birmingham.....	54.00
Silica clay, per ton.....	\$8.00 to 9.00

Magnesite Brick

	Per Net Ton
Standard size, f.o.b. Baltimore and Chester, Pa.....	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.....	40.00

Chrome Brick

	Per Net Ton
Standard size.....	\$48.00

Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

(Less-than-Carload Lots)

(F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)

	Per Cent Off List
Machine bolts, small, rolled threads.....	60 and 10
Machine bolts, all sizes, cut threads.....	50, 10 and 10
Carriage bolts, smaller and shorter, rolled threads.....	50, 10 and 10
Carriage bolts, cut threads, all sizes.....	50 and 10
Eagle carriage bolts.....	65 and 10
Lag bolts.....	60, 10 and 10
Plow bolts, Nos. 3 and 7 heads.....	50 and 10
(Extra of 20% for other style heads)	
Machine bolts, c.p.c. and t. nuts, 1/2 x 4 in.....	45, 10 and 5
Larger and longer sizes.....	45, 10 and 5
Bolt ends with hot-pressed nuts.....	50, 10 and 10
Bolt ends with cold-pressed nuts.....	45, 10 and 5
Hot-pressed nuts, blank and tapped, square, 4.00c. per lb. off list	
Hot-pressed nuts, blank or tapped, hexagons, 4.40c. per lb. off list	
C.p.c. and t. square or hex. nuts, blank or tapped.....	4.10c. per lb. off list
Washers.....	6.50c. to 6.25c. per lb. off list

*F.o.b. Chicago and Pittsburgh.
The discount on machine, carriage and lag bolts is 5 per cent more than above for car lots. On hot-pressed and cold-pressed nuts the discount is 25c. more per 100 lb. than quoted above for car lots.

Bolts and Nuts

(Quoted with actual freight allowed up to but not exceeding 50c. per 100 lb.)

	Per Cent Off List
Semi-finished hexagon nuts:	
1/2 in. and smaller, U. S. S.....	80, 10 and 5
3/4 in. and larger, U. S. S.....	75, 10 and 5
Small sizes, S. A. E.....	80, 10, 10 and 5
S. A. E., 1/2 in. and larger.....	75, 10, 10 and 5
Stove bolts in packages.....	80, 10 and 5
Stove bolts in bulk.....	80, 10, 5 and 2 1/2
Tire bolts.....	60 and 5

Semi-Finished Castellated and Slotted Nuts

(Actual freight allowed up to but not exceeding 50c. per 100 lb.)

(To jobbers and consumers in large quantities)

	Per 100 Net S.A.E. U.S.S.	Per 100 Net S.A.E. U.S.S.
1/4-in.....	\$0.44 \$0.44	1/4-in..... \$2.35 \$2.40
1/2-in.....	0.515 0.515	1/2-in..... 3.60 3.60
3/4-in.....	0.62 0.66	3/4-in..... 5.65 5.80
1-in.....	0.79 0.90	1-in..... 8.90 8.90
1 1/4-in.....	1.01 1.05	1 1/4-in..... 12.60 13.10
1 1/2-in.....	1.28 1.42	1 1/2-in..... 18.35 18.35
2-in.....	1.70 1.78	2-in..... 21.00 21.00

Larger sizes.—Prices on application.

Large Rivets

	Base Per 100 Lb.
F.o.b. Pittsburgh.....	\$2.50 to \$2.60
F.o.b. Cleveland.....	2.70
F.o.b. Chicago.....	2.75

Small Rivets

	Per Cent Off List
F.o.b. Pittsburgh.....	70 and 10
F.o.b. Cleveland.....	70 and 10
F.o.b. Chicago.....	70 and 10 to 70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb.)

	Per Cent Off List
Milled cap screws.....	80 and 10
Milled standard set screws, case hardened.....	80 and 5
Milled headless set screws, cut thread.....	80
Upset hex. head cap screws, U. S. S. thread.....	80, 10 and 10
Upset hex. cap screws, S. A. E. thread.....	80, 10 and 10
Upset set screws.....	80, 10 and 5
Milled studs.....	70 and 5

Chicago

Record Output of Steel in March—Pig Iron Shipments Heavy

CHICAGO, March 30.—Preliminary estimates by makers of finished steel in the Chicago district indicate that March production established a record. The month, besides containing only four Sundays and Saturdays, afforded weather which was highly favorable to peak operations at the mills. During the first three days of March the Steel Corporation had in blast 20 furnaces, and this number was then increased by lighting the No. 4 furnace at South Chicago, bringing the total to 21 out of its 27 stacks. The Inland Steel Co. was not able to start its new blast furnace, and as a result, for over three weeks during March there were 27 steel works stacks active out of a total of 35 in the district. In orders passed to entry at the mills March exceeded both January and February, and the month closes with specifications still in excess of shipments. This is of particular interest inasmuch as March shipments have been record-breaking. The foremost independent closes the month with 24 out of 25 open-hearth furnaces active.

New business in plates, shapes and bars is equal to shipments, and Chicago mill prices on these products are firm. First quarter closes with mill order books fairly evenly balanced, indicating that business is emanating from widely diversified sources. Evidence at hand indicates that current shipments are being readily absorbed in consumption and that stocks in the hands of buyers are low.

Spot sales of merchant pig iron are exceptionally heavy for the month, and makers have been forced to blow in another stack, presumably to replace the tonnage lost to the trade by the blowing out of the Thomas furnace.

Further weakness is developing in the scrap market, and with a more than adequate supply of all grades, the trade sees little chance for improved conditions in the immediate future.

Pig Iron.—The second Mayville furnace was blown in March 30, and so production of merchant iron is again on approximately the same basis as during the first 10 days of the month, when the Thomas stack was in blast. Active furnaces now include two Iroquois, two Federal, two Mayville stacks and the Zenith furnace. Spot sales of Northern iron during March have been unusually heavy, largely because of the propensity of users to withhold forward contracting in favor of buying smaller tonnages to cover requirements for 30 to 60 days. Second quarter buying is still lagging, although it is reported that here and there a user has committed himself for the next 90 days. March shipments average slightly better than those of February, and producers are generally of the opinion that final figures will show that shipments for the first quarter of 1926 established a record for the Chicago district. A fair amount of silvery is being placed from day to day, but users, as a rule, will not commit themselves ahead. A melter in southern Wisconsin is inquiring for 700 tons of the 10 per cent grade. Silvery prices are unchanged and steady.

Quotations on Northern foundry, high phosphorus and malleable iron are f.o.b. local furnace, and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards.

Northern No. 2 foundry, sil. 1.75 to 2.25	\$23.00
Northern No. 1 foundry, sil. 2.25 to 2.75	23.50
Malleable, not over 2.25 sil.	23.00
High phosphorus	23.00
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (all rail)	\$27.01 to 28.01
Southern No. 2 (barge and rail)	26.18 to 27.18
Low phos., sil. 1 to 2 per cent, copper free	31.20 to 31.70
Silvery, sil. 8 per cent.	25.29
Ferrosilicon, 14 to 16 per cent.	48.79

Coke.—The Chicago district oven price for by-product foundry coke is steady at \$10.50 or \$11, delivered. Domestic sizes will be reduced \$1 on April 1.

Ferroalloys.—Ferromanganese has developed further weakness and is now quoted at \$88, seaboard, for delivery over the remainder of the year. Although users have placed good tonnages at this price, they are still insisting that protective clauses be incorporated in contracts. Spiegeleisen is still quotable at \$33, base Hazard, Pa., or \$40.76, delivered, for the 17 to 19 per cent grade. Domestic makers are not able to offer any of the 19 to 21 per cent grade, which with a \$1 differential would be quotable at \$41.76, delivered. The higher grade material, however, is reaching this territory through the importation of foreign spiegeleisen at the port of New Orleans, from which the freight rate is 20c. less than from Hazard.

We quote 80 per cent ferromanganese, \$95.56 to \$97.56, delivered Chicago; 50 per cent ferrosilicon, \$85, delivered, spiegeleisen, 18 to 22 per cent, \$41.56, delivered Chicago.

Plates.—The outstanding plate inquiry of the week is 6000 tons for oil tanks to be erected by the Roxana Petroleum Corporation at its new refinery near East Chicago, Ind. Other inquiries from the oil industry call for 4000 tons of plates, and two gas holders will require 2800 tons. The trade does not look for much more oil tank work in the immediate future, for the reason that warmer weather will bring heavy drafts on oil reserves, releasing some of the storage capacity used during the winter. The Northern Pacific has placed 1000 automobile cars, for which local mills expect to supply 10,000 to 12,000 tons of plates, shapes and bars. Car builders are finding little cheer in the railroad equipment market, for with the Northern Pacific contracts placed, the only inquiry of any size still before the trade is one from the Burlington for 500 hopper cars. Car builders' specifications to mills during the week totaled about 35,000 tons. The demand for universal mill plates is well sustained, and deliveries are not improving.

The mill quotation on plates is 2.10c. per lb., base, Chicago.

Sheets.—Both new business and specifications in black sheet are slightly improved. This is also true of galvanized, modified weather having brought out a substantial demand for roofing. Although second quarter buying has gained some momentum during the week, it is still far short of the rate anticipated by producers. The Chicago mill quotations on all sheet products are well established.

Chicago delivered prices from mill are 3.50c. for No. 28 black, 2.65c. for No. 10 blue annealed and 4.75c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Structural Material.—Building activity has again come to the fore, and fabricators have specified close to 10,000 tons of plates, shapes and bars during the week. The outstanding structural award was 4000 tons for Illinois Central repair shops at Paducah, Ky. A new hotel in Chicago will require 2000 tons, and fabricators look for a substantial inquiry from the Roxana Petroleum Corporation for its new refinery at East Chicago, Ind. The second section of the Furniture Mart, Chicago, will be under way within the next few weeks. This will require about 4000 tons, which was awarded to a fabricator some time ago, but has not as yet been specified at the mills. There is little change in prices on fabricated material. An ordinary type of office building will cost from \$67 to \$72 per ton, theaters will run from \$72 to \$80, and mill construction of the heavier type will average about \$72.

The mill quotation on plain material is 2.10c. per lb., base, Chicago.

Bars.—New business in soft steel bars is equal to shipments, and specifications are slightly in excess of the ability of mills to make deliveries. As a whole, the demand is well sustained from the manufacturing trade, with the possible exception of farm implement makers, who late in the week reduced production schedules which had been maintained throughout the late winter months. The Chicago mill price of 2.10c. is steady. Demand for alloy steel bars shows gradual improvement, with prices unchanged. One iron bar mill reports the heaviest order books in two years.

The mill price of 2c., Chicago, is firm. The operations of rail steel bar mills are unchanged, and hard bars are steady at 2c., Chicago. For makers of fence posts March was a record month in shipments and specifications. Indications of less activity in general lines requiring rail steel bars have made their appearance within the last few days. March specifications in hard bars are well ahead of those for the same month last year, and will also show a gain over February. Although quiet conditions obtain among bed manufacturers, they are shopping around for material for April and May delivery.

Mill prices per lb. are: Mild steel bars, 2.10c., base, Chicago; common bar iron, 2c., base, Chicago; rail steel bars, 2c., base, Chicago.

Wire Products.—Weather conditions throughout the Central and Northern States still restrict merchant trade. Business is good throughout the South and the reported deflation of the Florida land boom has had little effect upon the volume of orders from that section. Demand for field fencing and barbed wire is better and is expected to expand materially when spring weather, favorable to fence construction, prevails. Specifications from the manufacturing trade are expanding slowly and second quarter contracts, at prevailing prices, are being closed more rapidly. Prices, which are unchanged, are shown on page 943.

Rails and Track Supplies.—The railroads have again been liberal in placing track accessory contracts, and mills have booked 8000 tons of tie plates, 15,000 tons of joints and 25,000 kegs of spikes and bolts. A good tonnage of iron tie plates was placed within the week and specifications against old contracts are liberal. Rail mill operations are full in the Chicago district.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled from billets, \$36 to \$38 per gross ton, f.o.b. maker's mill.

Standard railroad spikes, 2.90c. to 3c. per lb. mill; track bolts with square nuts, 3.90c. to 4c. mill; steel tie plates, 2.25c., mill; angle bars, 2.75c., mill.

Cold-Rolled Strip.—Both new business and specifications are heavier, and operations have been expanded. New business is being taken at 3.90c., base Cleveland, or 4.20c., delivered Chicago.

Cast Iron Pipe.—After the rush of the past two weeks both inquiry and buying of cast iron pipe have slackened. James B. Clow & Sons were low with \$41.65, base Birmingham, on 1000 tons of 4 to 16-in. Class B pipe for Barberton, Ohio. The United States Cast Iron Pipe & Foundry Co. is reported to have taken 120 tons for Mansfield, Ohio, and 1070 tons of 6 to 24-in. Class C pipe for Springfield, Ill. A number of small municipal contracts have been placed, and makers report that a substantial tonnage is being bought by public utilities. Milwaukee will close April 8 on 1440 tons of plain and 330 tons of lugged pipe, and 120 tons of special castings, in diameters ranging from 30-in. to 48-in. On 2375 tons of 36, 48 and 54-in. pipe and 72 tons of special castings for the same city the United States Cast Iron Pipe & Foundry Co. is low bidder, with a quotation of \$38.40, base Birmingham, or \$46.90, de-

livered, on the plain pipe which constituted most of the tonnage.

We quote per net ton, delivered Chicago, as follows: Water pipe, 4-in., \$53.20 to \$54.20; 6-in. and over, \$49.20 to \$50.20; Class A and gas pipe, \$4 extra.

Reinforcing Bars.—Although awards are fairly liberal they do not equal, in the aggregate, the tonnage represented in fresh inquiry. Here and there a figured job is dropped by its promoters, and there are indications that other pending projects lack proper financial backing. Shipments against many of the larger contracts placed late in 1925 have been completed, and although shops continue to operate at an unchanged rate, they are working largely on small current orders ranging from 25 to 50 tons each. Billet concrete bars from warehouse are holding at 2.60c., but contracting of late has been on such a small scale that it remains to be seen what price would be brought out by a sizable tonnage. New inquiries and recent lettings are shown on page 944.

Bolts, Nuts, and Rivets.—Second quarter contracting is about 95 per cent completed. As a rule, users have been taking their full first quarter obligations. Makers' operations are close to 80 per cent of capacity.

Old Material.—This market is unusually quiet, and prices are leaning toward the weaker side. The trade is at a loss to explain the situation and feels that barring an unforeseen turn in the market, prices will recede still further. The present price level, with a few exceptions, has been maintained for three or four weeks. Within the past few weeks the supply has been running close to demand, with an occasional shortage in a particular grade. This situation now appears to be changing, and dealers and brokers are having no difficulty in meeting all short delivery demands. There is a growing tendency to sell in larger quantities, which suggests that yard stocks are being liquidated and that some dealers are selling short. Stocks in the hands of consumers are not large. Large users, while buying from time to time, are doing so quietly and in relatively small lots, so as to disturb the market as little as possible. The Inland Steel Co. has bought 2000 tons of heavy melting steel at \$14.25 per gross ton, delivered. A group of merchant furnaces took a substantial tonnage of cast iron borings at \$12.25 per gross ton, delivered. A large local maker of plumbing supplies took fair tonnages of railroad malleable at \$18 per gross ton, delivered, and railroad cast at \$16.07 per net ton.

We quote delivered in consumers' yards, Chicago and vicinity, all freight and transfer charges paid for all items except relaying rails, including angle bars to match, which are quoted f.o.b. dealers' yards:

	Per Gross Ton
Heavy melting steel	\$14.00 to \$14.25
Frogs, switches and guards, cut apart, and miscellaneous rails	15.25 to 15.75
Shoveling steel	13.75 to 14.00
Hydraulic compressed sheets	12.00 to 12.50
Drop forge flashings	11.00 to 11.50
Forged, cast and rolled steel car wheels	18.25 to 18.75
Railroad tires, charging box size	18.25 to 18.75
Railroad leaf springs, cut apart	18.25 to 18.75
Steel couplers and knuckles	16.50 to 17.00
Coil springs	19.00 to 19.50
Low phos. punchings	17.50 to 18.00
Axle turnings	15.25 to 15.75
Relaying rails, 56 lb. to 60 lb.	25.00 to 26.00
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Rerolling rails	16.50 to 17.00
Steel rails, less than 3 ft.	17.50 to 18.00
Iron rails	16.00 to 16.50
Cast iron borings	11.75 to 12.25
Short shoveling turnings	11.75 to 12.25
Machine shop turnings	8.75 to 9.25
Railroad malleable	17.50 to 18.00
Agricultural malleable	16.50 to 17.00
Angle bars, steel	16.50 to 17.00
Cast iron car wheels	17.00 to 17.50

	Per Net Ton
No. 1 machinery cast	17.00 to 17.50
No. 1 railroad cast	15.75 to 16.25
No. 1 agricultural cast	15.75 to 16.25
Stove plate	13.75 to 14.25
Grate bars	12.25 to 13.75
Brake shoes	12.50 to 13.00
Iron angle and splice bars	15.75 to 16.25
Iron arch bars and transoms	20.50 to 21.00
Iron car axles	25.00 to 25.50
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	12.25 to 12.75
No. 1 busheling	11.00 to 11.50
No. 2 busheling	7.50 to 8.00
Locomotive tires, smooth	16.50 to 17.00
Pipes and flues	10.00 to 10.50

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Mild steel bars	3.00c.
Reinforcing bars, billet steel	2.60c.
Cold-finished steel bars and shafting	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Hoops	4.15c.
Bands	3.65c.
No. 28 black sheets	4.10c.
No. 10 blue annealed sheets	3.50c.
No. 28 galvanized sheets	5.25c.
Standard railroad spikes	3.55c.
Track bolts	4.55c.
Structural rivets	3.50c.
Boiler rivets	3.70c.
	Per Cent off List
Machine bolts	50 and 5
Carriage bolts	47½
Coach or lag screws	55 and 5
Hot-pressed nuts, square, tapped or blank	
3.25c. off per lb.	
Hot-pressed nuts, hexagon, tapped or blank	
3.75c. off per lb.	
No. 8 black annealed wire, per 100 lb.	\$3.30
Common wire nails, base per keg	3.05
Cement coated nails, per count keg	\$2.05 to 2.20

Boston

Demand for Domestic Iron More Active— Plates Stronger—Scrap Erratic

BOSTON, March 30.—Although foreign pig iron is still available at considerably less than domestic, more interest is being shown in Buffalo iron for second quarter delivery at \$21, furnace base, than for several weeks, and a fair amount of business has been closed the past week. Of the foreign irons available, English and German have been the most active. Prices at which German iron is offered, particularly in Connecticut, are in line with those recently noted, i.e. \$20.50, on dock duty paid, and even less, but in a majority of instances these quotations are on "distress" iron. English foundry, silicon 2.25 to 2.75 per cent, has been sold as low as \$21, on dock duty paid, while Indian iron has brought 50c. to \$1 a ton higher. Connecticut melters report that eastern Pennsylvania iron can be obtained at less than \$22, furnace base. The report, however, appears to be based on requests for offers and not on actual sales. Sales of iron in New England the past week showed a slight falling off, in the aggregate not exceeding 4000 tons, as reported. The melt is just about holding its own, but is below the peak for 1926.

We quote delivered prices on the basis of the latest sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia, and \$9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25.....	\$25.65 to \$26.15
East. Penn., sil. 2.25 to 2.75.....	26.15 to 26.65
Buffalo, sil. 1.75 to 2.25.....	25.91
Buffalo, sil. 2.25 to 2.75.....	26.41
Virginia, sil. 1.75 to 2.25.....	29.92
Virginia, sil. 2.25 to 2.75.....	30.42
Alabama, sil. 1.75 to 2.25.....	31.60 to 32.60
Alabama, sil. 2.25 to 2.75.....	32.10 to 33.10

Shapes and Plates.—It now appears that previous assertions by plate interests, that New England consumers are covered for second quarter were premature. Buyers who assured mills they were about to close, in many instances have held back. Plate prices are distinctly firmer. From a low point of 1.70c. per lb., base Pittsburgh, for March, the market today is generally 1.80c., and at least one mill quotes 1.90c. on second quarter business. The market for shapes is firm at 1.90c. per lb., base Pittsburgh. Deliveries are tightening up. Local fabricators have closed on a fairly large number of small jobs the past week.

Cast Iron Pipe.—German pipe interests were the low bidders for 2800 tons of 6-in. to 20-in. pipe wanted by Quincy, Mass. No award has been made, however. Approximately half a dozen New England cities and towns are now withholding awards as a result of foreign pipe makers submitting lower bids than domestic producers. Brookline, Mass., will open bids April 2 for about 450 tons of 6-in. to 16-in. New England specification pipe, and Everett, Mass., will take figures April 5 on an indefinite tonnage for its 1926 requirements. Prices quoted openly on domestic pipe are: 4-in., \$60.10 a ton, delivered common Boston freight rate points; 6-in. and larger, \$55.10. The usual \$5 differential on Class A and gas pipe is asked.

Coke.—The by-product foundry coke situation is very much the same as a week ago. Specifications against first-half contracts during March were somewhat less than those in February and considerably so as compared with January. Foundries have been working down reserve supplies in expectation of lower prices. March goes out with the New England Coal & Coke Co. and the Providence Gas Co. holding to \$13 a ton, delivered within a \$3.10 freight rate zone. By-product domestic coke is still selling well, notwithstanding a cut in retail anthracite prices to a basis 50c. a ton above that established in the spring of 1925. There seems little doubt that anthracite coal has lost ground in New England as a result of the strike, while coke, especially by-product, has gained in favor.

Old Material.—Old material is somewhat more active, but business is still restricted by the unwillingness of holders of scrap to sell at prevailing prices. The disparity between prices paid for material is more pronounced than ever. Rejections by mills are frequent,

and losses to shippers in some instances run close to \$4 a ton. Prices paid recently for heavy melting steel include \$10.20 a ton at shipping point, \$10.85, \$11.50, \$11.60 and \$11.75. Specification pipe has sold at \$10.60, \$11, \$11.25 and \$11.50; steel turnings from \$9 up to \$9.60. Early last week mixed borings and turnings sold as low as \$8.20 to \$8.50. Today \$8.60 to \$9.10 is offered. In contrast, buyers which heretofore paid \$12 for chemical borings, are now offering \$11.50, and those which paid \$9.60 for long bundled cotton ties now offer \$9.35. Worcester, Mass., foundries came into the market for round tonnages of textile and machinery cast, lifting the former to \$20.75, delivered, and machinery cast to around \$20. Recent offers of textile at \$19.75 and of No. 1 machinery cast at \$19.25 have failed to interest buyers. The scrap situation clearly is more unsettled than is usually the case.

The following prices are for gross-ton lots delivered consuming points:

Textile cast	\$19.25 to \$19.75
No. 1 machinery cast.....	19.00 to 19.50
No. 2 machinery cast.....	14.50 to 15.50
Stove plate	14.00 to 14.50
Railroad malleable	19.50 to 20.00

The following prices are offered per gross-ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$10.85 to \$11.75
No. 1 railroad wrought	13.00 to 13.50
No. 1 yard wrought	12.00 to 12.50
Wrought pipe (1 in. in diameter, over 2 ft. long).....	11.00 to 11.50
Machine shop turnings.....	9.00 to 9.50
Cast iron borings, chemical.....	11.00 to 11.50
Cast iron borings, rolling mill.....	9.00 to 9.50
Blast furnace borings and turnings	8.50 to 9.00
Forged scrap	8.75 to 9.50
Bundled skeleton, long	8.75 to 9.50
Forged flashings	9.00 to 9.50
Bundled cotton ties, long	9.00 to 9.50
Bundled cotton ties, short	9.50 to 10.00
Shafting	16.75 to 17.00
Street car axles	16.50 to 17.00
Rails for rerolling	12.50 to 13.00
Scrap rails	11.00 to 11.50

St. Louis

More Interest in Pig Iron—Foundry Coke Contracts Closed

ST. LOUIS, March 30.—Although sales of pig iron during the week totaled less than 1000 tons, all for prompt shipment, there were more inquiries than for several weeks past and better feeling seems to prevail in the district. A Peoria melter is in the market for 500 tons of malleable, a heating appliance manufacturer wants 1000 to 3000 tons of foundry, and a wheel manufacturer wants from 600 to 1000 tons. Odd inquiries aggregate 800 tons. Sales of the St. Louis Coke & Iron Corporation for prompt shipment totaled 600 tons. Prices are nominally unchanged.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices, \$2.16 freight from Chicago, \$4.42 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25...	\$25.16
Northern malleable, sil. 1.75 to 2.25	25.16
Basic	25.16
Southern fdy., sil. 1.75 to 2.25...	\$26.42 to 27.92
Granite City iron, sil. 1.75 to 2.25.	24.31 to 24.81

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, mild steel or iron.....	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
No. 28 black sheets	4.60c.
No. 10 blue annealed sheets	3.60c.
No. 28 galvanized sheets	5.70c.
Black corrugated sheets	4.65c.
Galvanized corrugated sheets.....	5.75c.
Structural rivets	3.65c.
Boiler rivets	3.85c.
Per Cent off List	
Tank rivets, $\frac{7}{8}$ -in. and smaller.....	70
Machine bolts	55
Carriage bolts	50 and 5
Lag screws	55 $\frac{1}{2}$
Hot-pressed nuts, square, blank or tapped	3.25c. off per lb.
Hot-pressed nuts, hexagons, blank or tapped	3.75c. off per lb.

Coke.—Spring contracts for foundry coke are now being made. The St. Louis Coke & Iron Corporation reports having closed contracts during the week for from 8000 to 9000 tons for shipment during the 12 months, beginning April 1, at \$10 to \$10.50, f.o.b. Granite City ovens. There is still a good demand for domestic grades.

Finished Iron and Steel.—Manufacturers in the Oklahoma oil fields report a good spring business, but they are buying material cautiously. Reports from the Joplin lead belt are that efforts are being made to reduce production, and there is very little buying of steel products in that section. There has been no let-up in specifications, but little new business is being placed. Building materials are in light demand.

Old Material.—The market continues dull, with no changes in prices. Consumers are buying only from hand to mouth, and seem to be holding out for lower prices. Railroad and other lists are heavy, including: Dodge Brothers, Detroit, 8000 tons; Chicago, Milwaukee & St. Paul, 9200; Chicago, Burlington & Quincy, 6000 tons; Wabash, 3000 tons, and 570 tons of wheels; Union Pacific, 3000 tons; Missouri-Kansas-Texas, 300 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton		
Iron rails	\$13.00 to	\$13.50
Rails for rolling	16.00 to	16.50
Steel rails less than 3 ft.	17.00 to	17.50
Relaying rails, 60 lb. and under	24.00 to	25.00
Relaying rails, 70 lb. and over	30.00 to	31.00
Cast iron car wheels	17.25 to	17.75
Heavy melting steel	14.00 to	14.50
Heavy shoveling steel	14.00 to	14.50
Frogs, switches and guards cut apart	15.00 to	15.50
Railroad springs	17.25 to	17.75
Heavy axle and tire turnings	11.00 to	11.50
No. 1 locomotive tires	16.50 to	17.00
Per Net Ton		
Steel angle bars	12.50 to	13.00
Steel car axles	17.75 to	18.25
Iron car axles	22.50 to	23.00
Wrought iron bars and transoms	19.50 to	20.00
No. 1 railroad wrought	11.50 to	12.00
No. 2 railroad wrought	12.50 to	13.00
Cast iron borings	9.50 to	10.00
No. 1 busheling	10.50 to	11.00
No. 1 railroad cast	14.75 to	15.25
No. 1 machinery cast	16.50 to	17.00
Railroad malleable	13.50 to	14.00
Machine shop turnings	6.75 to	7.25
Bundled sheets	7.50 to	8.00

Birmingham

Plates and Shapes Stronger—Blast Furnaces Have Good Backlog

BIRMINGHAM, March 30.—The second quarter of the year will open with more than 50 per cent of the probable Alabama output of foundry pig iron committed. The needs of the larger melters are expected to more than absorb the remainder of the make. With current sales steady, if not heavy, there is no tendency to modify prices. Furnaces are still holding to \$22, Birmingham, for No. 2 foundry, with \$23 asked on small tonnages for spot shipment. Pig iron production in Alabama will show a material decline for March, because of accidents at two blast furnaces and the blowing out of a third for repairs. One stack is to be blown in this week but two others will be blown out, all three being on basic iron. The Woodward Iron Co. will not be able to get its No. 2 furnace back into commission for several months. The Central Iron & Coal Co. will blow in a furnace on foundry iron, but will offer only a portion of the output on the open market. The Tennessee Coal, Iron & Railroad Co. is blowing in its No. 3 furnace at Ensley and will blow out a sister furnace for repairs. The Gulf States Steel Co. furnace, which is on basic, will also go out for repairs. The Sloss-Sheffield Steel & Iron Co., with six furnaces, the Republic Iron & Steel Co. with two and the Woodward Iron Co. with four, besides the one of the Tennessee company, will probably be able to satisfy the merchant needs of customers during the second quarter. Upward of 35,000 tons of foundry iron on yards will also be available. Melt in this territory is well sus-

tained, with some foundries committed beyond the second quarter.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil...	\$22.00
No. 1 foundry, 2.25 to 2.75 sil...	22.50
Basic	22.00
Charcoal, warm blast	\$30.00 to 32.00

Rolled Steel.—Both structural shapes and plates are stronger, with shapes ranging from 2.05c. to 2.15c. per lb., base Birmingham, and plates from 2c. to 2.05c. A healthy market situation is reflected in the high rate of activity at mills and fabricating shops. The lifting of an embargo on shipments to Florida has stimulated the movement of steel to that State. New business in track fastenings and other railroad accessories has resulted in a speeding up of output in those products. The Connors Steel Co., Birmingham, is starting a mill which will reroll rails into concrete bars, angles, fence posts and other shapes. This company is still importing French billets besides using local steel. Soft steel bars remain unchanged at 2.15c. to 2.25c. per lb., base Birmingham.

Cast Iron Pipe.—In view of numerous lettings, especially in the Middle West and Northwest, pipe shops are preparing to speed up production. Unfilled tonnage on hand and in sight insures a high rate of output for a considerable period ahead.

Coke.—Demand is still surprisingly good, and prices on foundry grade are being maintained at \$5.50 per net ton, Birmingham. Considerable coke continues to be shipped into the North and Middle West.

Old Material.—With little material piling up in the yards of consumers and with cancellations of contracts exceptional, considerable scrap is moving. Dealers have reduced their yard forces very little, since they find it necessary to continue preparing scrap to meet specifications against standing obligations. New business, however, is light and prices are weak.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical	\$15.00 to \$16.00
Heavy melting steel	13.00 to 14.00
Railroad wrought	12.00 to 13.00
Steel axles	18.00 to 19.00
Iron axles	18.00 to 19.00
Steel rails	18.00 to 18.50
No. 1 cast	17.00 to 17.50
Tramcar wheels	17.00 to 17.50
Car wheels	16.00 to 16.50
Stove plate	14.00 to 14.50
Machine shop turnings	8.00 to 8.50
Cast iron borings	8.00 to 9.00
Rails for rolling	15.00 to 16.00

San Francisco

Impending Strike Retards Structural Activity—Lower Plate Quotations

SAN FRANCISCO, March 26 (By Air Mail).—In sharp contrast with the activity in structural material and plates during the first three weeks of March, the past week has brought out no fresh inquiries of importance and only two fabricated lettings calling for over 100 tons of steel. The chief reason for this is said to be the probability of a carpenters' strike in San Francisco and the East Bay cities. It is generally believed that if the union carpenters walk out, union members in other building trades will follow, stopping all local construction work. Several San Francisco banks are understood to have refused to enter into negotiations for the financing of certain proposed projects until the labor situation has been clarified.

Pig Iron.—A local importer has received a shipment of about 1000 tons of Indian foundry iron, which is being distributed to melters in Los Angeles, the San Francisco Bay district and Seattle. While there are indications that second quarter business will be substantial, it is not expected that the tonnage melted will be as large as during the same period last year. Local foundries are not particularly active, and the labor situation is anything but satisfactory. In this respect conditions in Los Angeles are more favorable for con-

tinuous operations. Quotations on domestic and imported irons are unchanged.

*Utah basic	\$27.00 to \$28.00
*Utah foundry, sil. 2.75 to 3.25...	27.00 to 28.00
**English foundry, sil. 2.75 to 3.25...	25.00 to 26.00
**Belgium foundry, sil. 2.75 to 3.25...	24.00
**Dutch foundry, sil. 2.75 to 3.25...	24.00
**Indian foundry, sil. 2.75 to 3.25...	24.00 to 25.00
**German foundry, sil. 2.75 to 3.25...	24.00
**Chinese foundry, sil. 3 to 3.50...	25.50

*Delivered San Francisco.

**Duty paid, f.o.b. cars San Francisco.

Structural Shapes.—While less than 2.35c., c.i.f. Coast ports, is understood to have been quoted by an Eastern mill during the past week, confirmation is lacking. Most of the Eastern mills continue to ask 2.35c., and practically all of the business that has been taken recently has been figured on that basis. Awards during the past week total 475 tons, and no fresh inquiries have been developed. The largest individual job, the San Leandro High School, Oakland, 300 tons, was taken by the Pacific Coast Engineering Co.

Plates.—While the two largest producers continue to ask 2.30c., c.i.f. Coast ports, some of the other Eastern mills have quoted 2.25c. during the week on moderate-sized tonnages, although it is not definitely known that any business has yet been placed at that figure. No awards calling for over 100 tons are reported. The city of San Diego, Cal., has postponed until April 5 the opening of bids on the proposed El Capitan pipe line, calling for about 12,000 tons. The Dalles, Ore., has rejected bids on 500 tons for a pipe line, previously reported as awarded. New bids on both steel and wood pipe will be opened March 29. The city of Spokane, Wash., will open bids April 1 on 320 tons for a pipe line.

Bars.—For the first time this month a job calling for over 100 tons of reinforcing bars has been placed with a San Francisco jobber. While a large number of projects have been let recently, all of them have called for less than 100 tons of steel. The letting this week was 350 tons for the Hunter-Dulin Building, San Francisco. Barrett & Hilt, San Francisco, have been awarded the general contract for Navy hospital buildings to be erected on Mare Island in San Francisco Bay. These will require 600 tons of reinforcing bars. Bids have been filed for the West Portal School, San Francisco, calling for about 125 tons. Local concrete bar jobbers continue to quote as follows: 2.80c., base per lb. on lots of 250 tons; 2.95c., base, per lb. on carload lots, and 3.20c., base, on less-than-carload lots.

Cast Iron Pipe.—A referendum will be taken in the city of Palo Alto, Cal., April 29, on certain improvements calling for the purchase of 1050 tons of 4 to 14-in. Class B water pipe. The city of San Diego, Cal., has placed 242 tons with the McWane Cast Iron Pipe Co. The cities of Whittier and Oxnard, Cal., have awarded 45 tons and 22 tons respectively to B. Nicoll & Co. The 3500 tons of 24-in. Class B pipe called for by the city of Santa Monica, Cal., has not yet been awarded, and there is said to be some possibility that steel pipe will be used in preference to cast iron.

Steel Pipe.—The Associated Pipe Line Co., a subsidiary of the Associated Oil Co., San Francisco, is inquiring for about 150 tons of 2½ to 3-in. line pipe. No other inquiries of importance have come into the market.

Warehouse Business.—Local jobbers report an improvement in the demand for wire products. General business is apparently satisfactory, but individual orders are still relatively small. Prices are unchanged.

Warehouse Prices, F.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.30c.
Mild steel bars and small angles	3.30c.
Small channels and tees, ¼-in. to 2¼-in.	3.90c.
Spring steel, ¼-in. and thicker	6.30c.
No. 28 black sheets	4.75c.
No. 10 blue annealed sheets	3.75c.
No. 28 galvanized sheets	6.00c.
Common wire nails, base per keg	\$3.50
Cement coated nails, base per keg	3.00

Ferroalloys.—Quotations on English ferromanganese have weakened, but few local importers are inclined to quote on the present market. For some time quotations on 80 per cent English ferromanganese have been fairly firm at \$117.50, duty paid, San Francisco. It is understood that British producers have lowered their quotations about \$5 per gross ton, which should make it possible for local users to buy at about \$112.50. However, there is very little business being done at present.

Coke.—Conditions in the coke market are similar to those in pig iron. Current sales are light, no fresh inquiries of importance have developed recently, and prices are unchanged.

English beehive, \$15 to \$16 per ton at incoming dock, and English by-product, \$12 to \$14; German by-product, \$11.50 to \$12.

Buffalo

Better Inquiry for Pig Iron but Buying Lags—Sheets Firmer

BUFFALO, March 30.—A few good-sized inquiries are out, but these are not being translated into orders very rapidly. The General Electric Co. inquiry for 5100 tons has not been placed and probably will not be placed until later this week. Local producers believe this iron will go to Port Henry and Lake Erie furnaces. Nine hundred tons of malleable figured in the recent 2000-ton purchase by the Massey-Harris Harvester Co., Batavia, N. Y., and it is believed some resale iron was bought. The Ingersoll-Rand Co. is inquiring for 600 tons of malleable and 200 tons of foundry. Producers state that \$21, Buffalo, has not been shaded. In the territory in and immediately contiguous to Buffalo two or three sizable inquiries are out—one for

Warehouse Prices, F.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Mild steel bars	3.30c.
Cold-finished shapes	4.45c.
Rounds	3.95c.
No. 28 black sheets	4.60c.
No. 10 blue annealed sheets	3.90c.
No. 28 galvanized sheets	5.75c.
Common wire nails, base per keg	\$3.90
Black wire, base per 100 lb.	3.90

1500 tons of foundry and malleable and another for 1000 tons of foundry and malleable. Producers look for heavier buying within the next two weeks.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

No. 2 plain fdry., sil. 1.75 to 2.25	\$21.00
No. 2X foundry, sil. 2.25 to 2.75	21.50
No. 1X foundry, sil. 2.75 to 3.25	22.50
Malleable, sil. up to 2.25	21.00
Basic	\$20.50 to 21.00
Lake Superior charcoal	29.25

Finished Iron and Steel.—There is little change in the price situation. Bars are still quoted at 2.265c., Buffalo, shapes at 2.165c. and plates at 2.065c. Business is fair, and most mills look for an improvement. Backlogs are holding up and, in fact, are better than in the earlier part of the year. Sheet prices, producers say, are firmer, with black sheets strong at 3.35c., base Pittsburgh. Lettings of reinforcing bars have not been heavy, but makers are fairly busy estimating. Contracts have been awarded road builders in the vicinity of Emporium, Pa., for 12 miles of improved highway, requiring 300 tons of reinforcing steel. Seven or eight jobs averaging 100 to 150 tons apiece are in prospect in Rochester territory, though these may not all go ahead this spring. Warehouse business continues to improve. It is estimated that it is 15 per cent heavier than in February and 10 per cent greater than in March, 1925. Fabricating business is slow.

Old Material.—Varying reports have been obtained regarding the sale of a tonnage of heavy melting steel

to a local mill. According to one report, this purchase was made at \$15.50; the mill in question denies making any purchase of a large lot and states that it has confined its buying to small lots for which it has paid \$15. Some stove plate is coming out, and this is being sold quickly at \$15.25. The market generally shows an abundance of scrap available, with plenty of fresh material coming out.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	\$15.50 to \$16.00
Low phosphorus	17.50 to 18.00
No. 1 railroad wrought	14.00 to 14.50
Car wheels	17.00 to 17.50
Machine shop turnings	11.75 to 12.25
Mixed borings and turnings	12.50 to 13.00
Cast iron borings	12.50 to 13.00
No. 1 busheling	14.00 to 14.50
Stove plate	15.00 to 15.25
Grate bars	13.00 to 13.50
Hand-bundled sheets	11.00 to 11.50
Hydraulic compressed	14.50 to 15.00
No. 1 machinery cast	17.00 to 17.50
Railroad malleable	18.50 to 19.00
Iron axles	24.00 to 25.00
Steel axles	16.00 to 16.50

Cleveland

Automobile Output Not Up to Expectations—Valley Iron Stiffens

CLEVELAND, March 30.—Mills continue to enter a very satisfactory volume of orders for finished steel. Business taken by some of the local sales offices increased in March over February, and with others the daily average was about the same, so that the increase was due to the longer month. Contract tonnage for March was well taken out. Some consumers, who still have steel due on first quarter contracts, have had the deliveries extended and have covered for additional material for the second quarter. However, contracting for the second quarter is rather light. It is still the general policy of buyers to keep stocks low and to order material as needed, and in some cases they are delaying purchasing so long that some of the mills are unable to make the deliveries as promptly as wanted. With the steady flow of orders that enables mills to maintain present operations, producers are no longer experiencing the anxiety they formerly did over the absence of a backlog. Nor do they regard the amount of unfilled tonnage as much of a barometer of the steel situation as they have in the past.

A survey of the present condition of the automotive industry shows that production is going ahead at a fairly high rate, although sales are not up to some of the sanguine expectations of a few weeks ago, which caused a number of car builders to go on production schedules that they have found it advisable to curtail. Not to build cars faster than they can be sold appears to be the general attitude of automobile builders. While the plant of one maker of low-priced cars is being operated at a sharply reduced schedule, some of the other plants making popular-priced models are running close to capacity. There has been a slowing down by some of the automobile parts makers.

There is no change in the price situation. Steel bars are firm at 2c., Pittsburgh, but most mills have abandoned efforts to get 2.10c. for small lots. Plates are now firm at 1.90c., and structural material ranges from 1.90c. to 2c. New inquiry in the building field is light. The Canadian National Railways has revived an inquiry that it sent out late last year for two car ferries. These will require 2500 tons of steel each.

Pig Iron.—A firmer tone in the price situation in the Valley district is the outstanding feature of the pig iron market. During the early part of the past week Valley makers took some foundry iron at \$19.50 furnace, and this price concession was not confined to one producer. Now \$20.50, furnace has been reestablished by all Valley makers as the price on both foundry and malleable iron and has been tested by the sale of one or two fair-sized lots. Two or three Valley producers seem to have decided to hold firmly to \$20.50, even if they should lose business by so doing. The firmer price situation in the Valley has not affected quotations in

Cleveland, as one Cleveland producer is still quoting on the basis of \$20, Valley, for shipment to points where there is Valley competition, although some local iron has been sold at \$20.50 for shipment to points where Cleveland furnaces have a freight advantage over the Valley district. For Cleveland delivery the price is unchanged at \$21 for foundry and malleable iron. The prices on these grades are unchanged at \$22, furnace, in Michigan and in parts of Indiana, but a Lake producer is now going to \$21.50, furnace, in western Ohio and central Indiana, or a reduction of 50c., which was evidently due to southern Ohio competition. The market does not show much activity, although two producers sold 13,000 tons the past week. A fair amount of small-lot business came from Cleveland foundries. Many consumers are buying from hand to mouth, which has resulted in a large number of orders ranging from a carload up to 100 tons. Round-lot inquiries from the Westinghouse Electric & Mfg. Co., the General Electric Co., and the Pennsylvania Railroad are still pending. Other new inquiries include one from Michigan for 1500 tons and one from Indiana for 1000 tons. Shipments of leading producers during March will exceed production, as they did during the first two months of the year.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6.01 from Birmingham:

Basic, Valley furnace	\$20.00
N'th'n No. 2 fdy., sil. 1.75 to 2.25	21.50
Southern fdy., sil. 1.75 to 2.25	\$27.51 to 28.01
Malleable	21.50
Ohio silvery, 8 per cent	33.52
Standard low phos., Valley furnace	\$27.50 to 28.00

Semi-Finished Steel.—Some business in sheet bars and slabs is being placed for second quarter at either first quarter prices or subject to trade paper quotations, but consumers are not buying as heavily as they did for the first quarter. Some consumers will carry contract material over to the second quarter and have not yet come into the market for additional steel.

Sheets.—Sales during March showed a fair gain over February. However, consumers are not buying very far ahead, and some producers have orders for only one or two weeks for the common grades, but are filled up for several weeks with specifications for automobile body sheets. Despite efforts of several producers to hold the market firmly at schedule prices, galvanized sheets can still be had at 4.50c., Pittsburgh, and blue annealed at 2.40c. On black sheets 3.25c. is still fairly common.

Warehouse Business.—Commercial steel bars, plates and shapes are moving in good volume out of stock, and March sales by some of the jobbing houses show a gain over February. The demand for reinforcing bars is inactive, owing to the local building strike, and sheets are rather quiet. Prices are steady.

Reinforcing Bars.—The award of considerable work is being delayed because of the strike in the local building industry, and shipment of material on work started is being held up. Rail steel bars are unchanged at 1.80c., mill.

Iron Ore.—The Ford Motor Co. during the week purchased approximately 300,000 tons of various grades of Lake Superior ore for this year's delivery. This purchase was divided among four leading ore interests. Another round-lot sale was 150,000 tons to a Pittsburgh district steel interest. It is understood that both buyers paid the full market price. However, the Ford

Warehouse Prices, f.o.b. Cleveland

	Base per lb.
Plates and structural shapes	2.90c.
Mild steel bars	2.00c.
Cold-finished rounds and hexagons	3.90c.
Cold-finished flats and squares	4.40c.
Hoops and bands	3.65c.
No. 28 black sheets	4.10c.
No. 10 blue annealed sheets	3.25c.
No. 28 galvanized sheets	6.25c.
No. 9 annealed wire, per 100 lb.	\$3.00
No. 9 galvanized wire, per 100 lb.	3.45
Common wire nails, base per keg	3.00

company bought its ore on an upper Lake port basis, as this company will carry the ore in its own boats. The market at present has a firm tone. If weakness should develop this season, it is not expected to appear for several weeks. In view of the fact that there was price shading during the two previous weeks, some buyers may delay making their purchases until later in the season. It is understood that the schedule of the United States Steel Corporation calls for shipments of 25,000,000 tons of ore this year, or approximately the same amount as was shipped last year.

Coke.—The price of Painesville by-product foundry coke has been fixed at \$8, ovens, for April shipment, a decline of 50c. from March. By-product coke for domestic use has declined to \$5 and is in light demand.

Bolts, Nuts and Rivets.—The demand for bolts and nuts continues good, although the automotive industry is not specifying quite as freely as a few weeks ago. Prices are firm. Many rivet consumers are covering with second quarter contracts at \$2.60 per 100 lb. for large rivets. Demand for small rivets is fairly heavy.

Fluorspar.—Leading producers continue to hold to \$18 for gravel fluorspar, and carlot sales have been made at that price, although \$17 is reported to have been quoted by one or more of the smaller producers.

Ferromanganese.—The price war has resulted in a further cut of \$2 a ton, and the market is now quoted at \$88 to \$90, seaboard.

Seamless Mechanical Tubing.—Orders have improved recently, but competition is very keen and discounts placed in effect last July are not being maintained by some of the manufacturers. On round-lot orders a discount of 60 per cent off list is reported, or 5 per cent more than the regular discount.

Old Material.—Some activity in heavy melting steel developed in the Valley district during the past week. One mill purchased 5000 tons and another 2000 tons from a Cleveland dealer at \$16.50 to \$16.75. Mills are not inclined to buy far ahead. Locally scrap is inactive, and Cleveland still appears to be one of the weakest spots in the market. Dealers have tried unsuccessfully to sell heavy melting steel at \$15, delivered, to local mills, and others are offering \$14 for this grade to fill short orders. With no sales the past week, borings and turnings are untested. Dodge Brothers, Inc., will close April 1 on a scrap list covering April production and totaling 8000 tons. Heavy melting steel has declined 25c. a ton, but other prices are unchanged.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel.....	\$14.00 to \$14.25
Rails for rolling.....	16.75 to 17.00
Rails under 3 ft.....	18.50 to 19.00
Low phosphorus melting.....	17.75 to 18.25
Cast iron borings.....	11.00 to 11.25
Machine shop turnings.....	10.75 to 11.00
Mixed borings and short turnings.....	11.00 to 11.25
Compressed sheet steel.....	13.25 to 13.50
Railroad wrought.....	13.75 to 14.25
Railroad malleable.....	20.00 to 20.50
Light bundled sheet stampings.....	11.75 to 12.00
Steel axle turnings.....	14.00 to 14.50
No. 1 cast.....	17.50 to 18.00
No. 1 busheling.....	11.00 to 11.25
Drop forge flashings.....	13.25 to 13.50
Railroad grate bars.....	13.25 to 13.50
Stove plate.....	13.25 to 13.50
Pipes and flues.....	11.50 to 12.00

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes.....	3.40c.
Bars, mild steel or iron.....	3.30c.
Reinforcing bars.....	3.30c.
Hoops.....	4.00c. to 4.25c.
Bands.....	3.95c.
Cold-finished rounds and hexagons.....	3.85c.
Squares.....	4.35c.
Open-hearth spring steel.....	4.75c. to 5.75c.
No. 28 black sheets.....	4.10c. to 4.30c.
No. 10 blue annealed sheets.....	3.60c.
No. 28 galvanized sheets.....	5.25c. to 5.40c.
Structural rivets.....	3.75c.
Small rivets.....	.65 per cent off list
No. 9 annealed wire, per 100 lb.....	\$3.00
Common wire nails, base per keg.....	2.95
Cement coated nails, base per keg.....	2.25
Chain, per 100 lb.....	7.55
Net per 100 ft.	
Lap welded steel boiler tubes, 2-in.....	\$18.00
4-in.....	38.00
Seamless steel boiler tubes, 2-in.....	19.00
4-in.....	39.00

New York

Pig Iron Buying Continues—Steel Market Colorless—Ferromanganese Drops

NEW YORK, March 30.—Sales of both domestic and foreign pig iron in this market totaled over 20,000 tons last week, but it cannot yet be said that a general buying movement is under way. On the contrary, most of the tonnage placed is accounted for by purchases by a relatively small number of large buyers, one or two of which contracted through third quarter. Several factors stand in the way of general market activity. In the first place, although melt has not declined, it did not reach the proportions expected, with the consequence that considerable first quarter iron will carry over into second quarter. Moreover, liberal purchases of bargains in foreign iron will, in some cases, take care of a large part of users' requirements. There is also the fact that the smaller melters, particularly jobbing foundries with limited forward orders, see no signs of an early advance in pig iron prices and therefore no incentive to speculate on their future requirements. Prices on domestic iron seem to be holding very well in view of reported shading on large sales. Foreign material is available at substantially the same prices as heretofore, i. e., \$20.25 to \$21.00, with some special grades commanding as high as \$21.50, duty paid port of entry. The General Electric Co. inquiry for 5500 tons is understood to be still open outside of about 900 tons bought for Pittsfield, Mass. An inquiry from the Ingersoll-Rand Co. for 200 tons of foundry and 600 tons of malleable for its Painted Post, N. Y., plant is reported closed. The Eastern Malleable Iron Co., Naugatuck, Conn., has bought about 1000 tons of malleable and various grades of foundry iron for filling-in purposes. The New Jersey Zinc Co. is in the market for 600 tons of No. 2X foundry. The new stack of the Hudson Valley Coke & Products Corporation at Troy, N. Y., was lighted March 29. The furnace has a backlog of several thousand tons to start on.

We quote per gross ton delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.54 from Virginia:

East. Pa. No. 2 fdy., sil. 1.75 to 2.25.....	\$24.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75.....	25.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25.....	25.52
Buffalo fdy., sil. 1.75 to 2.25.....	25.91
No. 2 Virginia fdy., sil. 1.75 to 2.25.....	29.54

Ferroalloys.—The bottom of the ferromanganese market was evidently not reached last week at \$90, for some few sales have been made since then at \$88, seaboard basis, by two sellers, one a domestic producer and another an importer of the electric alloy. The market is quotable at \$88 to \$95 for the domestic alloy and \$88 to \$110 for the imported seaboard or furnace. One domestic producer, who was selling at \$90 a week ago, has raised his quotation to \$95, having apparently sold most of his output. The British producers are still at \$110, seaboard, but there are predictions that they will lower their price in the very near future, possibly to levels below any of those now ruling. There is naturally very little new business and most consumers are believed to have pretty well covered their needs for some time to come. In the spiegeleisen market there have been sales of 300 to 400 tons and there are inquiries before the market amounting to 500 to 700 tons. Prices continue firm.

Finished Steel.—Steel users have specified fairly well against expiring first quarter contracts, but beyond this there is very little business in anticipation of second quarter requirements. The increase in plate tonnage during the past week has been marked, mainly in the way of specifications on contracts to anticipate the higher second quarter prices. Eastern plate mills are standing firmly for 1.90c., Pittsburgh, on any business originating after March 31. Some second quarter contracts have been entered at this figure. In other steel products there has not been the same incentive to clean up on first quarter hangover tonnage, as no price advances are expected. Sheet specifications have been a little slow, due probably to the sporadic cutting

on black and galvanized, amounting to \$2 a ton in some instances. Although expecting a good mill operation during April, the trade looks in vain for signs that will enable it to predict the course of business in the second and third months of the quarter. Structural steel lettings are not in very large amount for this time, but the outlook for continued activity is better than in some other lines. Railroad buying of cars and locomotives is disappointing, the past week having been almost devoid of business of importance.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c. to 2.44c. per lb.; plates, 2.24c.; structural shapes, 2.24c. to 2.34c.; bar iron, 2.24c.

Warehouse Business.—Prices are being maintained with but little shading on most products, but the volume of business for March, while the largest of any month this year, was considerably below the expected total. Demand for reinforcing bars and structural material is small and the recent active plate market has become quiet. Black and galvanized sheets are being successfully maintained on a basis of 4.50c. and 5.65c. per lb. base, respectively. Brass and copper products are off about 1/4c. per lb., with the virgin metal marked down. Prices on page 976. We quote boiler tubes per 100 ft. as follows:

Lap welded steel tubes, 2-in., \$17.33; seamless steel, 2-in., \$20.24; charcoal iron, 2-in., \$25; 4-in., \$67.

Old Material.—Consumer purchasing of most grades of scrap continues in moderate volume, but buyers are cautious and so firm in their refusal to pay prices that might advance the market from its present level that quotations are practically unchanged. No. 1 heavy melting steel continues to be purchased at \$15.50 to \$16 per ton, delivered to consumers in eastern Pennsylvania with \$16 and \$16.25 per ton being paid for delivery to a Coatesville, Pa., consumer, by brokers shipping on a recent purchase of about 15,000 tons. Purchases on a contract with another Coatesville consumer are being made at \$16 per ton. Specification pipe is still being bought at \$15.50 per ton, delivered Columbia, Pa., and \$16.50 per ton, delivered Lebanon. Shipments of stove plate are going forward to a Bayonne, N. J., foundry at \$13.50 per ton, delivered, the freight rate from New York being \$1.89. Heavy breakable cast is unchanged, but although brokers are still paying up to \$17.50 per ton, delivered to a Florence, N. J., foundry, a recent purchase by this consumer would only justify payment of \$17 per ton, delivered.

Buying prices per gross ton, New York, follow:

Heavy melting steel (yard)....	\$10.50 to \$11.00
Heavy melting steel (railroad or equivalent)	12.00 to 12.75
Rails for rolling	12.75 to 13.00
Relaying rails, nominal	23.00 to 24.00
Steel car axles	19.50 to 20.00
Iron car axles	23.50 to 24.00
No. 1 railroad wrought	14.50 to 15.00
Forge fire	10.00 to 10.50
No. 1 yard wrought, long	13.50 to 14.00
Cast borings (steel mill)	9.75 to 10.25
Cast borings (chemical)	12.50 to 13.00
Machine shop turnings	9.75 to 10.25
Mixed borings and turnings	10.00 to 10.25
Iron and steel pipe (1 in. diam., not under 2 ft. long)	11.75 to 12.75
Stove plate (steel mill)	9.75 to 10.25
Stove plate (foundry)	11.25 to 11.75
Locomotive grate bars	11.25 to 11.75
Malleable cast (railroad)	16.00 to 17.00
Cast iron car wheels	13.50 to 14.00
No. 1 heavy breakable cast	12.50 to 14.50

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	\$17.00 to \$17.50
No. 1 heavy cast (column, building material, etc.), cupola size	15.50 to 16.00
No. 2 cast (radiators, cast boilers, etc.)	14.50 to 15.00

Coke.—Prices continue unchanged at \$4.50 to \$5.50 per ton on the foundry grade. A liberal tonnage of domestic sizes is reported still available at low prices, but is exercising no appreciable effect on the furnace and foundry market. By-product is unchanged at \$10.50 to \$11.52 per ton, delivered in Newark or Jersey City, N. J.

Cast Iron Pipe.—Most makers are well booked on the smaller sizes for the next three months or more. Prices are firm, excepting when foreign competition is encoun-

tered. Danvers, Mass., finally awarded its pipe tonnage to the United States Cast Iron Pipe & Foundry Co., which will furnish De Lavaud centrifugal pipe. The 5300 tons of large sized pipe for Barraquilla, Colombia, which was originally awarded to the Geisenkirchen Bergwerks A. G. in Germany, then canceled and awarded to the Pont-a-Mousson works in France, has finally been placed with the United States Cast Iron Pipe & Foundry Co. Japanese export houses in New York have recently been securing prices on about 5000 tons of large sized water pipe for export to Japan.

We quote pressure pipe per net ton, f.o.b. New York in carload lots, as follows: 6-in. and larger, \$50.60 to \$52.60; 4-in. and 5-in., \$55.60 to \$57.60; 3-in., \$65.60 to \$67.60; with \$5 additional for Class A and gas pipe.

Cincinnati

Concessions on Resale Pig Iron—Foundry Coke Declines—Steel Firmer

CINCINNATI, March 30.—There has been a perceptible weakening in pig iron prices in the Ironton district in the past week. While furnaces are refusing to book second quarter business under \$21, Ironton, local brokers have disposed of resale iron at \$20.50 and in at least one instance have gone below that figure. Since Ironton producers are well situated so far as second quarter orders are concerned, it is not likely that they will shade their present quotation of \$21, furnace, in the immediate future. However, melters are reluctant to purchase much iron for forward delivery, and with coke prices lower and ore selling at last year's schedule, they feel that they will be able to buy their third quarter requirements under the prevailing market. Reports from Alabama indicate that producers have comfortably filled order books for second quarter, and, therefore, will probably adhere to \$22, base Birmingham, during the next two months, even though they are unable to compete locally at that price. There is a moderate demand for Tennessee iron at \$21.50, base Birmingham. Jackson County silvery iron is showing strength and is particularly active in Michigan. The Louisville & Nashville has closed for 930 tons of foundry and charcoal iron for second quarter shipment. A sale of 3500 tons of Northern iron to a consumer in this territory is noted. A local dealer disposed of 800 tons of Southern iron in the South. Although inquiries are scarce, melters are taking iron on contract at a satisfactory rate, and few requests for suspension of shipments have been received. A local dealer has sold 670 tons of spiegeleisen in scattered lots.

Based on freight rates of \$3.69 from Birmingham and \$1.89 from Ironton, we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base)....	\$25.69
Alabama fdy., sil. 2.25 to 2.75	26.19
Tennessee fdy., sil. 1.75 to 2.25	25.19
Southern Ohio silvery, 8 per cent.	32.39
So. Ohio fdy., sil. 1.75 to 2.25	\$22.39 to 22.89
So. Ohio malleable (nominal)	\$22.39 to 22.89

Finished Material.—While specifications and orders have increased somewhat in the past two weeks, the improvement has not been sufficient to offset the light tonnage booked early in the month. Consequently, the volume of business in March was less than in January, but showed a slight gain over February bookings. In most cases, first quarter sales measure up to those in the same period last year, and in several instances show a small increase. Buyers continue to purchase only for immediate needs, and so long as they can secure deliveries in 10 days to two weeks it is not likely that they will speculate on their future requirements. Sellers are making a strong effort to hold prices at present levels. It is seldom that a concession is noted, and in most instances the lower prices have been made by small mills eager for tonnage. The bar market is quiet. Quotations, however, are firm at 2c., base Pittsburgh. There has been a revival in the demand for plates, which are selling at 1.90c., base Pittsburgh. Structural shapes are steady at 1.90c., but with buying

tinuous operations. Quotations on domestic and imported irons are unchanged.

*Utah basic	\$27.00 to \$28.00
*Utah foundry, sil. 2.75 to 3.25...	27.00 to 28.00
**English foundry, sil. 2.75 to 3.25...	25.00 to 26.00
**Belgium foundry, sil. 2.75 to 3.25...	24.00
**Dutch foundry, sil. 2.75 to 3.25...	24.00
**Indian foundry, sil. 2.75 to 3.25...	24.00 to 25.00
**German foundry, sil. 2.75 to 3.25...	24.00
**Chinese foundry, sil. 3 to 3.50...	25.50

*Delivered San Francisco.

**Duty paid, f.o.b. cars San Francisco.

Structural Shapes.—While less than 2.35c., c.i.f. Coast ports, is understood to have been quoted by an Eastern mill during the past week, confirmation is lacking. Most of the Eastern mills continue to ask 2.35c., and practically all of the business that has been taken recently has been figured on that basis. Awards during the past week total 475 tons, and no fresh inquiries have been developed. The largest individual job, the San Leandro High School, Oakland, 300 tons, was taken by the Pacific Coast Engineering Co.

Plates.—While the two largest producers continue to ask 2.30c., c.i.f. Coast ports, some of the other Eastern mills have quoted 2.25c. during the week on moderate-sized tonnages, although it is not definitely known that any business has yet been placed at that figure. No awards calling for over 100 tons are reported. The city of San Diego, Cal., has postponed until April 5 the opening of bids on the proposed El Capitan pipe line, calling for about 12,000 tons. The Dalles, Ore., has rejected bids on 500 tons for a pipe line, previously reported as awarded. New bids on both steel and wood pipe will be opened March 29. The city of Spokane, Wash., will open bids April 1 on 320 tons for a pipe line.

Bars.—For the first time this month a job calling for over 100 tons of reinforcing bars has been placed with a San Francisco jobber. While a large number of projects have been let recently, all of them have called for less than 100 tons of steel. The letting this week was 350 tons for the Hunter-Dulin Building, San Francisco. Barrett & Hilt, San Francisco, have been awarded the general contract for Navy hospital buildings to be erected on Mare Island in San Francisco Bay. These will require 600 tons of reinforcing bars. Bids have been filed for the West Portal School, San Francisco, calling for about 125 tons. Local concrete bar jobbers continue to quote as follows: 2.80c., base per lb. on lots of 250 tons; 2.95c., base, per lb. on carload lots, and 3.20c., base, on less-than-carload lots.

Cast Iron Pipe.—A referendum will be taken in the city of Palo Alto, Cal., April 29, on certain improvements calling for the purchase of 1050 tons of 4 to 14-in. Class B water pipe. The city of San Diego, Cal., has placed 242 tons with the McWane Cast Iron Pipe Co. The cities of Whittier and Oxnard, Cal., have awarded 45 tons and 22 tons respectively to B. Nicoll & Co. The 3500 tons of 24-in. Class B pipe called for by the city of Santa Monica, Cal., has not yet been awarded, and there is said to be some possibility that steel pipe will be used in preference to cast iron.

Steel Pipe.—The Associated Pipe Line Co., a subsidiary of the Associated Oil Co., San Francisco, is inquiring for about 150 tons of 2½ to 3-in. line pipe. No other inquiries of importance have come into the market.

Warehouse Business.—Local jobbers report an improvement in the demand for wire products. General business is apparently satisfactory, but individual orders are still relatively small. Prices are unchanged.

Warehouse Prices, F.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.30c.
Mild steel bars and small angles	3.30c.
Small channels and tees, ¾-in. to 2¼-in. ..	3.90c.
Spring steel, ¼-in. and thicker	6.30c.
No. 28 black sheets	4.75c.
No. 10 blue annealed sheets	3.75c.
No. 28 galvanized sheets	6.00c.
Common wire nails, base per keg	\$3.50
Cement coated nails, base per keg	3.00

Ferroalloys.—Quotations on English ferromanganese have weakened, but few local importers are inclined to quote on the present market. For some time quotations on 80 per cent English ferromanganese have been fairly firm at \$117.50, duty paid, San Francisco. It is understood that British producers have lowered their quotations about \$5 per gross ton, which should make it possible for local users to buy at about \$112.50. However, there is very little business being done at present.

Coke.—Conditions in the coke market are similar to those in pig iron. Current sales are light, no fresh inquiries of importance have developed recently, and prices are unchanged.

English beehive, \$15 to \$16 per ton at incoming dock, and English by-product, \$12 to \$14; German by-product, \$11.50 to \$12.

Buffalo

Better Inquiry for Pig Iron but Buying Lags—Sheets Firmer

BUFFALO, March 30.—A few good-sized inquiries are out, but these are not being translated into orders very rapidly. The General Electric Co. inquiry for 5100 tons has not been placed and probably will not be placed until later this week. Local producers believe this iron will go to Port Henry and Lake Erie furnaces. Nine hundred tons of malleable figured in the recent 2000-ton purchase by the Massey-Harris Harvester Co., Batavia, N. Y., and it is believed some resale iron was bought. The Ingersoll-Rand Co. is inquiring for 600 tons of malleable and 200 tons of foundry. Producers state that \$21, Buffalo, has not been shaded. In the territory in and immediately contiguous to Buffalo two or three sizable inquiries are out—one for

Warehouse Prices, F.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Mild steel bars	3.30c.
Cold-finished shapes	4.45c.
Rounds	3.95c.
No. 28 black sheets	4.60c.
No. 10 blue annealed sheets	3.90c.
No. 28 galvanized sheets	5.75c.
Common wire nails, base per keg	\$3.90
Black wire, base per 100 lb.	3.90

1500 tons of foundry and malleable and another for 1000 tons of foundry and malleable. Producers look for heavier buying within the next two weeks.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

No. 2 plain fdry., sil. 1.75 to 2.25	\$21.00
No. 2X foundry, sil. 2.25 to 2.75 ..	21.50
No. 1X foundry, sil. 2.75 to 3.25 ..	22.50
Malleable, sil. up to 2.25	21.00
Basic	\$20.50 to 21.00
Lake Superior charcoal	29.28

Finished Iron and Steel.—There is little change in the price situation. Bars are still quoted at 2.265c., Buffalo, shapes at 2.165c. and plates at 2.065c. Business is fair, and most mills look for an improvement. Backlogs are holding up and, in fact, are better than in the earlier part of the year. Sheet prices, producers say, are firmer, with black sheets strong at 3.35c., base Pittsburgh. Lettings of reinforcing bars have not been heavy, but makers are fairly busy estimating. Contracts have been awarded road builders in the vicinity of Emporium, Pa., for 12 miles of improved highway, requiring 300 tons of reinforcing steel. Seven or eight jobs averaging 100 to 150 tons apiece are in prospect in Rochester territory, though these may not all go ahead this spring. Warehouse business continues to improve. It is estimated that it is 15 per cent heavier than in February and 10 per cent greater than in March, 1925. Fabricating business is slow.

Old Material.—Varying reports have been obtained regarding the sale of a tonnage of heavy melting steel

to a local mill. According to one report, this purchase was made at \$15.50; the mill in question denies making any purchase of a large lot and states that it has confined its buying to small lots for which it has paid \$15. Some stove plate is coming out, and this is being sold quickly at \$15.25. The market generally shows an abundance of scrap available, with plenty of fresh material coming out.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	\$15.50 to \$16.00
Low phosphorus	17.50 to 18.00
No. 1 railroad wrought	14.00 to 14.50
Car wheels	17.00 to 17.50
Machine shop turnings	11.75 to 12.25
Mixed borings and turnings	12.50 to 13.00
Cast iron borings	12.50 to 13.00
No. 1 bushelling	14.00 to 14.50
Stove plate	15.00 to 15.25
Grate bars	13.00 to 13.50
Hand-bundled sheets	11.00 to 11.50
Hydraulic compressed	14.50 to 15.00
No. 1 machinery cast	17.00 to 17.50
Railroad malleable	18.50 to 19.00
Iron axles	24.00 to 25.00
Steel axles	16.00 to 16.50

Cleveland

Automobile Output Not Up to Expectations—Valley Iron Stiffens

CLEVELAND, March 30.—Mills continue to enter a very satisfactory volume of orders for finished steel. Business taken by some of the local sales offices increased in March over February, and with others the daily average was about the same, so that the increase was due to the longer month. Contract tonnage for March was well taken out. Some consumers, who still have steel due on first quarter contracts, have had the deliveries extended and have covered for additional material for the second quarter. However, contracting for the second quarter is rather light. It is still the general policy of buyers to keep stocks low and to order material as needed, and in some cases they are delaying purchasing so long that some of the mills are unable to make the deliveries as promptly as wanted. With the steady flow of orders that enables mills to maintain present operations, producers are no longer experiencing the anxiety they formerly did over the absence of a backlog. Nor do they regard the amount of unfilled tonnage as much of a barometer of the steel situation as they have in the past.

A survey of the present condition of the automotive industry shows that production is going ahead at a fairly high rate, although sales are not up to some of the sanguine expectations of a few weeks ago, which caused a number of car builders to go on production schedules that they have found it advisable to curtail. Not to build cars faster than they can be sold appears to be the general attitude of automobile builders. While the plant of one maker of low-priced cars is being operated at a sharply reduced schedule, some of the other plants making popular-priced models are running close to capacity. There has been a slowing down by some of the automobile parts makers.

There is no change in the price situation. Steel bars are firm at 2c., Pittsburgh, but most mills have abandoned efforts to get 2.10c. for small lots. Plates are now firm at 1.90c., and structural material ranges from 1.90c. to 2c. New inquiry in the building field is light. The Canadian National Railways has revived an inquiry that it sent out late last year for two car ferries. These will require 2500 tons of steel each.

Pig Iron.—A firmer tone in the price situation in the Valley district is the outstanding feature of the pig iron market. During the early part of the past week Valley makers took some foundry iron at \$19.50 furnace, and this price concession was not confined to one producer. Now \$20.50, furnace has been reestablished by all Valley makers as the price on both foundry and malleable iron and has been tested by the sale of one or two fair-sized lots. Two or three Valley producers seem to have decided to hold firmly to \$20.50, even if they should lose business by so doing. The firmer price situation in the Valley has not affected quotations in

Cleveland, as one Cleveland producer is still quoting on the basis of \$20, Valley, for shipment to points where there is Valley competition, although some local iron has been sold at \$20.50 for shipment to points where Cleveland furnaces have a freight advantage over the Valley district. For Cleveland delivery the price is unchanged at \$21 for foundry and malleable iron. The prices on these grades are unchanged at \$22, furnace, in Michigan and in parts of Indiana, but a Lake producer is now going to \$21.50, furnace, in western Ohio and central Indiana, or a reduction of 50c., which was evidently due to southern Ohio competition. The market does not show much activity, although two producers sold 13,000 tons the past week. A fair amount of small-lot business came from Cleveland foundries. Many consumers are buying from hand to mouth, which has resulted in a large number of orders ranging from a carload up to 100 tons. Round-lot inquiries from the Westinghouse Electric & Mfg. Co., the General Electric Co., and the Pennsylvania Railroad are still pending. Other new inquiries include one from Michigan for 1500 tons and one from Indiana for 1000 tons. Shipments of leading producers during March will exceed production, as they did during the first two months of the year.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6.01 from Birmingham:

Basic, Valley furnace	\$20.00
N't'n No. 2 fdy., sil. 1.75 to 2.25	21.50
Southern fdy., sil. 1.75 to 2.25	\$27.51 to 28.01
Malleable	21.50
Ohio silvery, 8 per cent.	33.52
Standard low phos., Valley furnace	\$27.50 to 28.00

Semi-Finished Steel.—Some business in sheet bars and slabs is being placed for second quarter at either first quarter prices or subject to trade paper quotations, but consumers are not buying as heavily as they did for the first quarter. Some consumers will carry contract material over to the second quarter and have not yet come into the market for additional steel.

Sheets.—Sales during March showed a fair gain over February. However, consumers are not buying very far ahead, and some producers have orders for only one or two weeks for the common grades, but are filled up for several weeks with specifications for automobile body sheets. Despite efforts of several producers to hold the market firmly at schedule prices, galvanized sheets can still be had at 4.50c., Pittsburgh, and blue annealed at 2.40c. On black sheets 3.25c. is still fairly common.

Warehouse Business.—Commercial steel bars, plates and shapes are moving in good volume out of stock, and March sales by some of the jobbing houses show a gain over February. The demand for reinforcing bars is inactive, owing to the local building strike, and sheets are rather quiet. Prices are steady.

Reinforcing Bars.—The award of considerable work is being delayed because of the strike in the local building industry, and shipment of material on work started is being held up. Rail steel bars are unchanged at 1.80c., mill.

Iron Ore.—The Ford Motor Co. during the week purchased approximately 300,000 tons of various grades of Lake Superior ore for this year's delivery. This purchase was divided among four leading ore interests. Another round-lot sale was 150,000 tons to a Pittsburgh district steel interest. It is understood that both buyers paid the full market price. However, the Ford

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Mild steel bars	3.00c.
Cold-finished rounds and hexagons	3.90c.
Cold-finished flats and squares	4.40c.
Hoops and bands	3.65c.
No. 28 black sheets	4.10c.
No. 10 blue annealed sheets	3.25c.
No. 28 galvanized sheets	5.25c.
No. 9 annealed wire, per 100 lb.	\$3.00
No. 9 galvanized wire, per 100 lb.	3.45
Common wire nails, base per keg	3.00

company bought its ore on an upper Lake port basis, as this company will carry the ore in its own boats. The market at present has a firm tone. If weakness should develop this season, it is not expected to appear for several weeks. In view of the fact that there was price shading during the two previous weeks, some buyers may delay making their purchases until later in the season. It is understood that the schedule of the United States Steel Corporation calls for shipments of 25,000,000 tons of ore this year, or approximately the same amount as was shipped last year.

Coke.—The price of Painesville by-product foundry coke has been fixed at \$8, ovens, for April shipment, a decline of 50c. from March. By-product coke for domestic use has declined to \$5 and is in light demand.

Bolts, Nuts and Rivets.—The demand for bolts and nuts continues good, although the automotive industry is not specifying quite as freely as a few weeks ago. Prices are firm. Many rivet consumers are covering with second quarter contracts at \$2.60 per 100 lb. for large rivets. Demand for small rivets is fairly heavy.

Fluorspar.—Leading producers continue to hold to \$18 for gravel fluorspar, and carlot sales have been made at that price, although \$17 is reported to have been quoted by one or more of the smaller producers.

Ferromanganese.—The price war has resulted in a further cut of \$2 a ton, and the market is now quoted at \$88 to \$90, seaboard.

Seamless Mechanical Tubing.—Orders have improved recently, but competition is very keen and discounts placed in effect last July are not being maintained by some of the manufacturers. On round-lot orders a discount of 60 per cent off list is reported, or 5 per cent more than the regular discount.

Old Material.—Some activity in heavy melting steel developed in the Valley district during the past week. One mill purchased 5000 tons and another 2000 tons from a Cleveland dealer at \$16.50 to \$16.75. Mills are not inclined to buy far ahead. Locally scrap is inactive, and Cleveland still appears to be one of the weakest spots in the market. Dealers have tried unsuccessfully to sell heavy melting steel at \$15, delivered, to local mills, and others are offering \$14 for this grade to fill short orders. With no sales the past week, borings and turnings are untested. Dodge Brothers, Inc., will close April 1 on a scrap list covering April production and totaling 8000 tons. Heavy melting steel has declined 25c. a ton, but other prices are unchanged.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel.....	\$14.00 to \$14.25
Rails for rolling	16.75 to 17.00
Rails under 3 ft.....	18.50 to 19.00
Low phosphorus melting	17.75 to 18.25
Cast iron borings	11.00 to 11.25
Machine shop turnings	10.75 to 11.00
Mixed borings and short turnings	11.00 to 11.25
Compressed sheet steel	13.25 to 13.50
Railroad wrought	13.75 to 14.25
Railroad malleable	20.00 to 20.50
Light bundled sheet stampings	11.75 to 12.00
Steel axle turnings	14.00 to 14.50
No. 1 cast	17.50 to 18.00
No. 1 busheling	11.00 to 11.25
Drop forge flashings	13.25 to 13.50
Railroad grate bars	13.25 to 13.50
Stove plate	13.25 to 13.50
Pipes and flues	11.50 to 12.00

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes.....	3.40c.
Bars, mild steel or iron.....	3.30c.
Reinforcing bars	3.30c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel	4.75c. to 5.75c.
No. 28 black sheets	4.10c. to 4.30c.
No. 10 blue annealed sheets.....	3.60c.
No. 28 galvanized sheets.....	5.25c. to 5.40c.
Structural rivets	3.75c.
Small rivets .....	.65 per cent off list
No. 9 annealed wire, per 100 lb.....	\$3.00
Common wire nails, base per keg.....	2.95
Cement coated nails, base per keg.....	2.25
Chain, per 100 lb.....	7.55
Net per 100 ft.	
Lap welded steel boiler tubes, 2-in.....	\$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.....	19.00
4-in.	39.00

New York

Pig Iron Buying Continues—Steel Market Colorless—Ferromanganese Drops

NEW YORK, March 30.—Sales of both domestic and foreign pig iron in this market totaled over 20,000 tons last week, but it cannot yet be said that a general buying movement is under way. On the contrary, most of the tonnage placed is accounted for by purchases by a relatively small number of large buyers, one or two of which contracted through third quarter. Several factors stand in the way of general market activity. In the first place, although melt has not declined, it did not reach the proportions expected, with the consequence that considerable first quarter iron will carry over into second quarter. Moreover, liberal purchases of bargains in foreign iron will, in some cases, take care of a large part of users' requirements. There is also the fact that the smaller melters, particularly jobbing foundries with limited forward orders, see no signs of an early advance in pig iron prices and therefore no incentive to speculate on their future requirements. Prices on domestic iron seem to be holding very well in view of reported shading on large sales. Foreign material is available at substantially the same prices as heretofore, i. e., \$20.25 to \$21.00, with some special grades commanding as high as \$21.50, duty paid port of entry. The General Electric Co. inquiry for 5500 tons is understood to be still open outside of about 900 tons bought for Pittsfield, Mass. An inquiry from the Ingersoll-Rand Co. for 200 tons of foundry and 600 tons of malleable for its Painted Post, N. Y., plant is reported closed. The Eastern Malleable Iron Co., Naugatuck, Conn., has bought about 1000 tons of malleable and various grades of foundry iron for filling-in purposes. The New Jersey Zinc Co. is in the market for 600 tons of No. 2X foundry. The new stack of the Hudson Valley Coke & Products Corporation at Troy, N. Y., was lighted March 29. The furnace has a backlog of several thousand tons to start on.

We quote per gross ton delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.54 from Virginia:

East. Pa. No. 2 fdy., sil. 1.75 to 2.25.....	\$24.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75.....	25.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25.....	25.52
Buffalo fdy., sil. 1.75 to 2.25.....	25.91
No. 2 Virginia fdy., sil. 1.75 to 2.25.....	29.54

Ferroalloys.—The bottom of the ferromanganese market was evidently not reached last week at \$90, for some few sales have been made since then at \$88, seaboard basis, by two sellers, one a domestic producer and another an importer of the electric alloy. The market is quotable at \$88 to \$95 for the domestic alloy and \$88 to \$110 for the imported seaboard or furnace. One domestic producer, who was selling at \$90 a week ago, has raised his quotation to \$95, having apparently sold most of his output. The British producers are still at \$110, seaboard, but there are predictions that they will lower their price in the very near future, possibly to levels below any of those now ruling. There is naturally very little new business and most consumers are believed to have pretty well covered their needs for some time to come. In the spiegeleisen market there have been sales of 300 to 400 tons and there are inquiries before the market amounting to 500 to 700 tons. Prices continue firm.

Finished Steel.—Steel users have specified fairly well against expiring first quarter contracts, but beyond this there is very little business in anticipation of second quarter requirements. The increase in plate tonnage during the past week has been marked, mainly in the way of specifications on contracts to anticipate the higher second quarter prices. Eastern plate mills are standing firmly for 1.90c., Pittsburgh, on any business originating after March 31. Some second quarter contracts have been entered at this figure. In other steel products there has not been the same incentive to clean up on first quarter hangover tonnage, as no price advances are expected. Sheet specifications have been a little slow, due probably to the sporadic cutting

on black and galvanized, amounting to \$2 a ton in some instances. Although expecting a good mill operation during April, the trade looks in vain for signs that will enable it to predict the course of business in the second and third months of the quarter. Structural steel lettings are not in very large amount for this time, but the outlook for continued activity is better than in some other lines. Railroad buying of cars and locomotives is disappointing, the past week having been almost devoid of business of importance.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c. to 2.44c. per lb.; plates, 2.24c.; structural shapes, 2.24c. to 2.34c.; bar iron, 2.24c.

Warehouse Business.—Prices are being maintained with but little shading on most products, but the volume of business for March, while the largest of any month this year, was considerably below the expected total. Demand for reinforcing bars and structural material is small and the recent active plate market has become quiet. Black and galvanized sheets are being successfully maintained on a basis of 4.50c. and 5.65c. per lb. base, respectively. Brass and copper products are off about $\frac{1}{4}$ c. per lb., with the virgin metal marked down. Prices on page 976. We quote boiler tubes per 100 ft. as follows:

Lap welded steel tubes, 2-in., \$17.33; seamless steel, 2-in., \$20.24; charcoal iron, 2-in., \$25; 4-in., \$67.

Old Material.—Consumer purchasing of most grades of scrap continues in moderate volume, but buyers are cautious and so firm in their refusal to pay prices that might advance the market from its present level that quotations are practically unchanged. No. 1 heavy melting steel continues to be purchased at \$15.50 to \$16 per ton, delivered to consumers in eastern Pennsylvania with \$16 and \$16.25 per ton being paid for delivery to a Coatesville, Pa., consumer, by brokers shipping on a recent purchase of about 15,000 tons. Purchases on a contract with another Coatesville consumer are being made at \$16 per ton. Specification pipe is still being bought at \$15.50 per ton, delivered Columbia, Pa., and \$16.50 per ton, delivered Lebanon. Shipments of stove plate are going forward to a Bayonne, N. J., foundry at \$13.50 per ton, delivered, the freight rate from New York being \$1.89. Heavy breakable cast is unchanged, but although brokers are still paying up to \$17.50 per ton, delivered to a Florence, N. J., foundry, a recent purchase by this consumer would only justify payment of \$17 per ton, delivered.

Buying prices per gross ton, New York, follow:

Heavy melting steel (yard).....	\$10.50 to \$11.00
Heavy melting steel (railroad or equivalent)	12.00 to 12.75
Rails for rolling	12.75 to 13.00
Relaying rails, nominal	23.00 to 24.00
Steel car axles	19.50 to 20.00
Iron car axles	23.50 to 24.00
No. 1 railroad wrought	14.50 to 15.00
Forge fire	10.00 to 10.50
No. 1 yard wrought, long	13.50 to 14.00
Cast borings (steel mill).....	9.75 to 10.25
Cast borings (chemical).....	12.50 to 13.00
Machine shop turnings	9.75 to 10.25
Mixed borings and turnings.....	10.00 to 10.25
Iron and steel pipe (1 in. diam., not under 2 ft. long)	11.75 to 12.75
Stove plate (steel mill)	9.75 to 10.25
Stove plate (foundry)	11.25 to 11.75
Locomotive grate bars	11.25 to 11.75
Malleable cast (railroad)	16.00 to 17.00
Cast iron car wheels	13.50 to 14.00
No. 1 heavy breakable cast.....	12.50 to 14.50

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	\$17.00 to \$17.50
No. 1 heavy cast (column, building material, etc.), cupola size	15.50 to 16.00
No. 2 cast (radiators, cast boilers, etc.)	14.50 to 15.00

Coke.—Prices continue unchanged at \$4.50 to \$5.50 per ton on the foundry grade. A liberal tonnage of domestic sizes is reported still available at low prices, but is exercising no appreciable effect on the furnace and foundry market. By-product is unchanged at \$10.50 to \$11.52 per ton, delivered in Newark or Jersey City, N. J.

Cast Iron Pipe.—Most makers are well booked on the smaller sizes for the next three months or more. Prices are firm, excepting when foreign competition is encoun-

tered. Danvers, Mass., finally awarded its pipe tonnage to the United States Cast Iron Pipe & Foundry Co., which will furnish De Lavaud centrifugal pipe. The 5300 tons of large sized pipe for Barraquilla, Colombia, which was originally awarded to the Gelsenkirchen Bergwerks A. G. in Germany, then canceled and awarded to the Pont-a-Mousson works in France, has finally been placed with the United States Cast Iron Pipe & Foundry Co. Japanese export houses in New York have recently been securing prices on about 5000 tons of large sized water pipe for export to Japan.

We quote pressure pipe per net ton, f.o.b. New York in carload lots, as follows: 6-in. and larger, \$50.60 to \$52.60; 4-in. and 5-in., \$55.60 to \$57.60; 3-in., \$65.60 to \$67.60; with \$5 additional for Class A and gas pipe.

Cincinnati

Concessions on Resale Pig Iron—Foundry Coke Declines—Steel Firmer

CINCINNATI, March 30.—There has been a perceptible weakening in pig iron prices in the Ironton district in the past week. While furnaces are refusing to book second quarter business under \$21, Ironton, local brokers have disposed of resale iron at \$20.50 and in at least one instance have gone below that figure. Since Ironton producers are well situated so far as second quarter orders are concerned, it is not likely that they will shade their present quotation of \$21, furnace, in the immediate future. However, melters are reluctant to purchase much iron for forward delivery, and with coke prices lower and ore selling at last year's schedule, they feel that they will be able to buy their third quarter requirements under the prevailing market. Reports from Alabama indicate that producers have comfortably filled order books for second quarter, and, therefore, will probably adhere to \$22, base Birmingham, during the next two months, even though they are unable to compete locally at that price. There is a moderate demand for Tennessee iron at \$21.50, base Birmingham. Jackson County silvery iron is showing strength and is particularly active in Michigan. The Louisville & Nashville has closed for 930 tons of foundry and charcoal iron for second quarter shipment. A sale of 3500 tons of Northern iron to a consumer in this territory is noted. A local dealer disposed of 800 tons of Southern iron in the South. Although inquiries are scarce, melters are taking iron on contract at a satisfactory rate, and few requests for suspension of shipments have been received. A local dealer has sold 670 tons of spiegeleisen in scattered lots.

Based on freight rates of \$3.69 from Birmingham and \$1.89 from Ironton, we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base).....	\$25.69
Alabama fdy., sil. 2.25 to 2.75.....	26.19
Tennessee fdy., sil. 1.75 to 2.25.....	25.19
Southern Ohio silvery, 8 per cent.....	32.39
So. Ohio fdy., sil. 1.75 to 2.25.....	\$22.39 to 22.89
So. Ohio malleable (nominal).....	\$22.39 to 22.89

Finished Material.—While specifications and orders have increased somewhat in the past two weeks, the improvement has not been sufficient to offset the light tonnage booked early in the month. Consequently, the volume of business in March was less than in January, but showed a slight gain over February bookings. In most cases, first quarter sales measure up to those in the same period last year, and in several instances show a small increase. Buyers continue to purchase only for immediate needs, and so long as they can secure deliveries in 10 days to two weeks it is not likely that they will speculate on their future requirements. Sellers are making a strong effort to hold prices at present levels. It is seldom that a concession is noted, and in most instances the lower prices have been made by small mills eager for tonnage. The bar market is quiet. Quotations, however, are firm at 2c., base Pittsburgh. There has been a revival in the demand for plates, which are selling at 1.90c., base Pittsburgh. Structural shapes are steady at 1.90c., but with buying

limited. Consumers of automobile body sheets are specifying liberally, and the price is unchanged from 4.40c., base Pittsburgh. Cold weather has checked roofing work, with the result that galvanized sheets are only fairly active at best. However, no deviations from the price of 4.60c., base Pittsburgh, are reported. Blue annealed and black sheets are in moderate demand at 2.50c. and 3.35c., base Pittsburgh, respectively. The market for wire products is sluggish, with common wire nails selling at \$2.65 per keg, and plain wire at \$2.50 per 100 lb., Pittsburgh or Ironton. Local fabricators have only a small amount of work, but are bidding on a liberal number of small jobs, which should be awarded within the next month. Fresh contracts for several sizable gas holders will necessitate an immediate increase in the operations of the Stacey Mfg. Co.

Reinforcing Bars.—Awards have been confined to small jobs requiring from 25 to 75 tons, and sellers have not figured on any sizable tonnages in the past week. Indications point to a continuation of the present quiet condition through the first half of April. New billet bars are bringing 2c., Cleveland, and rail steel bars 1.90c., mill.

Warehouse Business.—The prevalence of cold weather has interfered materially with business so that sales in March, even though they equaled those in February, fell considerably short of the volume which local jobbers had anticipated. Dullness has been most pronounced in structural steel and in reinforcing bars. Prices are unchanged.

Coke.—By-product foundry coke, which has sold at \$10.64, delivered Cincinnati, during the past four months, has been reduced 50c. a ton, effective April 1. By-product domestic grades also have been affected by the recent recession in sales, egg and walnut now selling at \$7.14, delivered here, and No. 2 nut at \$6.64. Announcement has been made of a decrease in the schedule on by-product coke in the Detroit district. Foundry grades are bringing \$10, delivered Detroit, but coke for outside shipment is quoted at \$9.50, Detroit ovens. The price for domestic grades has been set at \$7.75 for Detroit delivery, and at \$7, Detroit ovens, for shipment to other Michigan consuming points. This represents a reduction of \$1.50 a ton. A local dealer has sold 3500 tons of Wise County furnace coke to a southern Ohio melter. There has been a steady movement of Wise County and New River foundry coke into this territory. The Louisville & Nashville is reported to have bought 750 tons of beehive coke at \$4.50, ovens.

Based on freight rates of \$2.14 from Ashland, Ky., \$3.53 from Connellsville, and \$2.59 from Wise County ovens and New River ovens, we quote f.o.b. Cincinnati: Connellsville foundry, \$7.53 to \$9.53; Wise County foundry, \$7.34 to \$7.59; New River foundry, \$9.59 to \$10.09; by-product foundry, \$10.14.

Old Material.—Further signs of weakness have appeared in the local market, and prices of many items again have turned downward. Little material is being purchased by mills, which are said to have large stock piles. Heavy melting steel is firm at \$13.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	\$13.00
Scrap rails for melting	\$12.50 to 13.00
Short rails	17.50 to 18.00
Relaying rails	27.00 to 27.50
Rails for rolling	14.00 to 14.50
Old car wheels	12.50 to 13.00
No. 1 locomotive tires	16.50 to 17.00
Railroad malleable	15.50 to 16.00
Agricultural malleable	14.50 to 15.00
Loose sheet clippings	8.00 to 9.00
Champion bundled sheets	9.50 to 10.00
Per Net Ton	
Cast iron borings	7.50 to 8.00
Machine shop turnings	7.00 to 7.50
No. 1 machinery cast	19.00 to 19.50
No. 1 railroad cast	14.50 to 15.00
Iron axles	21.50 to 22.00
No. 1 railroad wrought	10.00 to 10.50
Pipes and flues	8.00 to 8.50
No. 1 busheling	9.50 to 10.00
Mixed busheling	8.00 to 8.50
Burnt cast	8.00 to 8.50
Stove plate	9.50 to 10.00
Brake shoes	10.00 to 10.50

Philadelphia

Plates Established at 1.90c.—Blast Furnaces Have Good Bookings

PHILADELPHIA, March 30.—During the last week of first quarter, specifications against expiring steel contracts and new orders have been sufficient to insure a good rate of operation at Eastern mills through April. Day-to-day orders, though mostly in small tonnages, have made a fairly good aggregate. Shipments from mills continue heavy and are in excess of new business, and while some tapering off is to be expected, the volume is fairly satisfactory. Present indications are that the April production of steel in this district will not fall far short of the March rate. Except on plates, the price situation is unchanged. Eastern plate mills have succeeded in putting into effect the 1.90c. price announced a few weeks ago, and quite a number of second quarter contracts have been entered at this \$2 advance. All other finished steel products remain at the first quarter level.

Following fairly heavy buying of second quarter iron a week or 10 days ago, the pig iron market is quiet, with quotations on foundry iron firm at \$22, base furnace. The scrap market has shown moderate signs of strength, with slight gains in prices of several grades. Ferromanganese has declined to \$88, a further drop of \$2 a ton.

Ferromanganese.—Two domestic makers of ferromanganese have reduced their asking price from \$90 to \$88, furnace, while another holds to \$95. English makers have given no sign of meeting American prices. Contracts entered at \$95, or higher, have been revised to meet the new market situation.

Billets.—Quoted prices remain at \$35 for open-hearth rerolling quality and at \$40 for forging quality, Pittsburgh basis.

Pig Iron.—Several large users of foundry iron in the Newark district have closed for fairly large lots of iron, but in the immediate Philadelphia district the demand has been confined to small tonnages. The Thatcher Furnace Co., Essex Foundry Co., Singer Mfg. Co. and others have closed for good-sized tonnages and the Central Foundry Co., whose inquiry has been pending for weeks, is expected to buy this week. Foreign iron figured largely in some of these purchases. The largest buyers in the Philadelphia district are the Westinghouse Electric & Mfg. Co., Essington, Pa., and the Baldwin Locomotive Works, Philadelphia, each of which bought upward of 1000 tons. The United States Cast Iron Pipe & Foundry Co. has bought a fairly large tonnage for each of its plants, including 14,000 tons of Tennessee iron. East-

Warehouse Prices f.o.b. Philadelphia

	Base per Lb.
Tank steel plates, $\frac{3}{4}$ -in. and heavier	2.80c. to 3.00c.
Tank steel plates, $\frac{1}{2}$ -in.	3.00c.
Structural shapes	2.75c. to 2.90c.
Soft steel bars, small shapes and iron bars (except bands)	2.90c. to 3.20c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, $1\frac{1}{2}$ x $1\frac{1}{2}$ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	3.00c.
Cold-finished steel, rounds and hexagons	4.00c.
Cold-finished steel, squares and flats	4.50c.
Steel hoops	4.00c. to 4.25c.
Steel bands, No. 12 gage to $\frac{1}{2}$ -in., inclusive	3.75c. to 3.90c.
Spring steel	5.00c.
No. 28 black sheets	4.65c.
No. 10 blue annealed sheets	3.50c.
No. 28 galvanized sheets	5.85c.
Diamond pattern floor plates $\frac{1}{4}$ -in.	5.30c.
$\frac{1}{2}$ -in.	5.50c.
Rails	3.20c.
Tool steel	8.50c.
Norway iron	6.50c.

ern Pennsylvania furnaces continue to quote \$22, base furnace, on foundry iron, and while this price has been shaded on business in the New York territory, it is quite firm on orders from consumers nearer to Philadelphia. Furnaces in this district have very good order books and further price concessions on second quarter iron are regarded as unlikely.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$22.76 to \$23.63
East. Pa. No. 2X, 2.25 to 2.75 sil.	23.26 to 24.13
East. Pa. No. 1X	23.76 to 24.63
Virginia No. 2 plain, 1.75 to 2.25 sil.	27.67 to 28.67
Virginia No. 2X, 2.25 to 2.75 sil.	28.17 to 29.17
Basic, delivered eastern Pa.	21.75 to 22.50
Gray forge	22.00 to 22.50
Malleable	23.00 to 23.50
Standard low phos. (f.o.b. furnace)	22.50 to 23.50
Copper bearing low phos. (f.o.b. furnace)	23.50 to 24.00

Plates.—Eastern plate mills have taken enough business for second quarter at 1.90c., Pittsburgh, to establish that price. A good deal of tonnage has been specified against expiring first quarter contracts, most of which were at 1.80c., and the mills of this district are assured a fairly good operation during the next few weeks.

Structural Material.—New building projects are few and are mostly small, but mills are receiving liberal specifications from fabricators against old orders. On new tonnage the price situation is still somewhat weak, prices ranging from 1.80c. to 1.90c., Pittsburgh, the lower level prevailing on a goodly share of current orders.

Bars.—Although some consumers did not specify in full against first quarter contracts, the total bookings of steel bars in the past week have been fairly satisfying. There has been very little contracting for second quarter. Mills continue to quote 2c., Pittsburgh. Eastern makers of bar iron quote 2.22c., Philadelphia.

Sheets.—Most of the makers of sheets are adhering firmly to 4.60c., base Pittsburgh, on galvanized, 3.35c. on black and 2.50c. on blue annealed sheets for second quarter, but sheet users have been slow in making contracts.

Warehouse Business.—Price cutting on steel bars is reported to be less frequent, and most sales are at 2.90c. to 3c. for Philadelphia delivery. Other prices are fairly firm.

Old Material.—An Eastern plate manufacturer has bought about 10,000 tons of heavy melting steel at \$16.50 and \$16.75. The scrap market, as a whole, is slightly stronger, with the upward tendency of prices most pronounced on No. 1 railroad wrought, heavy breakable cast and pipe.

We quote for delivery, consuming points in this district, as follows:

No. 1 heavy melting steel	\$16.50 to \$16.75
Scrap rails	16.50 to 16.75
Steel rails for rolling	17.00 to 17.50
No. 1 low phos., heavy, 0.04 per cent and under	20.00 to 20.50
Couplers and knuckles	19.00 to 19.50
Rolled steel wheels	19.00 to 19.50
Cast iron car wheels	17.50 to 18.00
No. 1 railroad wrought	17.50 to 18.00
No. 1 yard wrought	16.50 to 17.00
No. 1 forge fire	14.50 to 15.00
Bundled sheets (for steel works)	14.00
Mixed borings and turnings (for blast furnace)	13.00 to 13.50
Machine shop turnings (for steel works)	14.00
Machine shop turnings (for rolling mill)	14.00 to 14.50
Heavy axle turnings (or equivalent)	15.00
Cast borings (for steel works and rolling mill)	14.00
Cast borings (for chemical plant)	15.50 to 16.00
No. 1 cast	17.50 to 18.50
Heavy breakable cast (for steel works)	16.50 to 17.00
Railroad grate bars	14.50
Stove plate (for steel works)	14.50
Wrought iron and soft steel pipes and tubes (new specifications)	16.00 to 16.50
Shafting	21.00 to 22.00
Steel axles	22.00 to 23.00

Imports.—Pig iron imports last week showed a marked falling off from the rate of preceding weeks, only 2152 tons having come in, of which 1507 tons was from India and 645 tons from France. Other imports

included 852 tons of steel bars from the Netherlands, 74 tons of structural steel from Germany and 45 tons of manganese ore from Cuba.

Malleable Castings Shipments Largest in Two Years; Production Below January

WASHINGTON, March 29.—Based on reports from 139 identical plants, three of which were idle in February, production of malleable castings during the latter month totaled 66,401 tons, as against 75,658 tons in January, according to the Department of Commerce. Operations in February were at the rate of 59.9 per cent of capacity, compared with 68.2 per cent in January. Shipments in February amounted to 63,422 tons, while orders booked aggregated 58,379 tons. The monthly capacity was 110,895 tons, the three idle plants having a capacity of 1600 tons.

Except for January and for the previous October, February production was the largest in more than a year. It compares with 60,181 tons in February, 1925, being 53 per cent of capacity. February shipments were much above those for January, and formed the largest total in about two years.

To Simplify Metal Doors and Trim

WASHINGTON, March 30.—The proposed simplification of sizes and types of hollow metal doors and trim, along with other matters, was considered today at a preliminary conference of manufacturers at the Department of Commerce. W. Chattin Wetherill, director of the Committee on Metals Utilization, presided. H. G. Garlock, Cleveland, secretary of the Hollow Metal Door and Trim Manufacturers' Association, was named chairman of a simplification committee. Other members of the committee include George Hughes, United Metal Products Co., Canton, Ohio; E. T. Johnson, Art Metal Construction Co., Jamestown, N. Y., and Ernest C. Probst, Metal Door & Trim Co., Laporte, Ind.

Implement Exports Maintain High Level

Large foreign shipments of implement exports from the United States which began in January were continued in February when the exports of agricultural implements from the United States amounted to \$8,731,883, which was an increase of approximately \$300,000 over the January exports and almost double the exports of February, 1925, which amounted to \$4,436,027, according to the Agricultural Implements Division of the Department of Commerce.

A new high mark was reached in the exports of wheel tractors in February when 7533, valued at \$3,799,116, were shipped to foreign countries. The February exports of wheel tractors show a considerable increase over similar shipments in February, 1925. The number exported was five times greater and the value showed an increase of nearly 300 per cent.

No Strengthening Factors in Detroit Scrap Market

DETROIT, March 30.—The larger proportion of the tonnage of waste material offered by producers in this district for April delivery was taken direct by mills and furnaces. There are no indications at present of any strengthening factors and current orders are sufficient to take care of the tonnage as it is coming out.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate. No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting and shoveling steel	\$13.50 to \$14.00
Borings and short turnings	10.00 to 10.50
Long turnings	8.50 to 9.00
No. 1 machinery cast	17.00 to 18.00
Automobile cast	23.00 to 24.00
Hydraulic compressed	11.75 to 12.25
Stove plate	13.50 to 14.50
No. 1 bushelling	11.75 to 12.25
Sheet clippings	7.00 to 7.50
Flashings	10.50 to 11.00

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery							
	Copper, New York		Straits Tin (Spot)	Lead		Zinc	
	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
24.....	14.25	13.75	64.75	8.37½	8.00	7.65	7.30
25.....	14.25	13.70	64.12½	8.37½	8.00	7.45	7.10
26.....	14.12½	13.62½	64.25	8.37½	8.00	7.50	7.15
27.....	14.12½	13.62½	.....	8.37½	8.00	7.47½	7.12½
29.....	14.12½	13.70	63.62½	8.37½	8.00	7.47½	7.12½
30.....	14.12½	13.62½	62.87½	8.37½	8.00	7.45	7.10

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, March 30.

All the markets have been affected adversely by the declines in the New York stock market and prices of all the metals are lower. Buying has been light.

Copper.—The prices of electrolytic copper are receding and, with the bottom of the market uncertain, buying by consumers has naturally been light. Undoubtedly the liquidation in the stock market has been one influence and so also have the lower prices in London. The sentimental influence has been reciprocal. Sellers say, however, that there is a large amount of copper yet to be bought and that even today, according to one producer, at least 8,000,000 lb. was ready to be placed when the price is right. Electrolytic copper got as low as 13.87½c. on March 26 which is the lowest price since June last year, when it touched 13.50c., delivered. Since this low level there has been a better tone which, together with an effort by producers to lift the market, has resulted in a quotation yesterday of 13.95c., delivered. Today the price is 13.87½c. This could possibly be shaded in one or two quarters, but is regarded as the general market in the absence of a fair test. As soon as the market appears stabilized, undoubtedly considerable buying will appear because consumers are very busy and specifications on contracts with producers are very heavy. The March output of most producers is well booked. Lake copper is quoted at 14.25c., delivered.

Tin.—Sales in the past week are estimated at 1000 tons, about equally divided between dealers and consumers, with deliveries as far ahead as June. One aggressive seller of futures is not so active now and is evidently sold out. On March 24 the largest dealer in June metal did considerable business at 62c. Yesterday the market was stagnant and today there has been fair activity, particularly as to inquiry, due largely to a sharp break in London where prices fell about £5 per ton from yesterday's. The unusual statement is made that the weakness in London is due to the fall in the American stock market. Spot standard tin today in London was quoted at £282, future standard at £275 17s. 6d. and spot Straits at £283 15s., all about £10 per ton below the quotations a week ago. The Singapore price today was £283 10s. Efforts have been made there by the principal well-known operator who has been making purchases to support the market. In the New York market spot Straits tin was quoted today at 62.87½c. Arrivals thus far this month have been 5315 tons, with 5230 tons reported afloat.

Lead.—The market here has slowed down definitely, with the London market heavy. A feature is the opinion of one dealer that world production has finally overtaken world consumption. Another interesting fact is that Mexican and Canadian lead can pay the duty of 1½c. per lb. and come into this market to better advantage than to be sent abroad. It is stated that the situation does not look at all like a return to the high levels of last year. The leading interest continues to quote 8.20c., New York, as its contract price with prices in the outside market as 8c., St. Louis, and 8.37½c., New York and Eastern points.

Zinc.—Further recessions in the prices of prime Western zinc have taken place until they have reached

7.10c. to 7.15c., St. Louis, or 7.45c. to 7.50c., New York. Only a moderate business is reported and operations in the galvanizing industry are said to be below 50 per cent of capacity. Here again the effect of lower prices of many standard stocks is being felt.

Nickel.—Wholesale lots of ingot nickel are quoted at 35c., shot nickel at 36c. and electrolytic at 39c.

Antimony.—Quotations for Chinese metal for spot and early delivery are a little lower at 19.25c., New York, duty paid. April-May arrivals are quoted at 19c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is obtainable as ingots at 27c. to 28c. per lb., delivered.

Old Metals.—The market is lower but business remains fair. Dealers' selling prices are as follows:

	Per Lb.
Copper, heavy and crucible.....	13.50c.
Copper, heavy and wire.....	12.75c.
Copper, light and bottoms.....	11.25c.
Heavy machine composition.....	10.00c.
Brass, heavy.....	9.00c.
Brass, light.....	7.75c.
No. 1 red brass or composition turnings.....	9.00c.
No. 1 yellow rod brass turnings.....	9.00c.
Lead, heavy.....	7.25c.
Lead, tea.....	6.25c.
Zinc.....	5.00c.
Cast aluminum.....	19.50c.
Sheet aluminum.....	19.50c.

Chicago

MARCH 30.—Zinc and tin have developed the greatest weakness in an inactive market, and transactions are small, with users buying from hand to mouth. The activity in old metals last week has not continued and the market is unusually dull. The prices of old metals are unchanged. We quote, in carload lots: Lake copper, 14.25c.; tin, 65.25c.; lead, 8.20c.; zinc, 7.30c.; in less than carload lots, antimony, 21c. On old metals we quote copper wire, crucible shapes and copper clips, 10.25c.; copper bottoms, 9.25c.; red brass, 9c.; yellow brass, 8c.; lead pipe, 6.50c.; zinc, 5c.; pewter, No. 1, 37c.; tin foil, 44c.; block tin, 52c.; aluminum, 19.50c.; all being dealers' prices for less than carload lots.

Non-Ferrous Rolled Products

Prices on brass, bronze and copper products were reduced ¼c. per lb. on March 26. Zinc and lead sheets remain unchanged after the reductions of last week. For New York warehouse prices, see page 976.

List Prices Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight Up to 75c. Per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets	
High brass.....	18.87½c.
Copper, hot rolled.....	22.50c.
Zinc.....	11.75c.
Lead (full sheets).....	11.75c.
Seamless Tubes	
High brass.....	23.50c.
Copper.....	24.25c.
Rods	
High brass.....	16.62½c.
Naval brass.....	19.37½c.
Wire	
Copper.....	16.00c.
High brass.....	19.37½c.
Copper in Rolls	
Brass Tubing.....	21.37½c.
Brass Tubing.....	26.87½c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide..	37.50c.
Tubes, base.....	48.00c.
Machine rods.....	34.00c.

Erratum

In an article in THE IRON AGE, March 11, page 709, entitled "Heat Treating Automobile Parts Shown by Film," the lecturer, J. M. Watson, metallurgical engineer Hupp Motor Car Corporation, Detroit, was reported as saying that the film "starts with specimens of steel carburized, among them axle I-beams and steering metals," etc. The speaker was wrongly quoted, because under no circumstances would he consider carburizing those particular parts, because extreme toughness is desired and not hardness.

PERSONAL

C. C. Fredericks has become president and general manager St. Louis Pump & Equipment Co. He was one of the founders of the company and was responsible for its growth. Before that he was with S. F. Bowser Co., Fort Wayne, Ind., and is regarded as an authority on modern pump design, construction and merchandising. Mr. Fredericks' first move was to engage Sherwood Hinds as chief engineer and vice-president. These two men have long been associated in the designing of liquid handling equipment. Several patents now regarded as standard in pump manufacture and used by various pump companies were originally Mr. Hinds' patents.



C. C. FREDERICKS

Horace A. Frommelt, formerly assistant works manager Falk Corporation, Milwaukee, is now associated with the International Correspondence Schools, Scranton, Pa., as consultant of its apprentice training division, to give his full time to the inauguration and development of apprentice training programs. Most of the time since 1920 Mr. Frommelt has been dealing with apprenticeship at first hand in the shops of the Falk Corporation. During the two years preceding, he was a member of the faculty of Marquette University where, as assistant professor in charge of cooperative work, he gained much valuable experience as an instructor and judge of boys. As a young man he served a special apprenticeship with the Chicago, Milwaukee & St. Paul Railroad.

L. J. Galbreath, until recently engaged in advertising and sales promotion activities for the Bridgeport Brass Co., has joined the American Brown-Boveri Electric Corporation to take charge of publicity and sales promotion for that company as assistant to Earl G. Hines, recently appointed general sales manager. Since graduation from Cornell University in 1917 Mr. Galbreath has served in executive and publicity capacities with the Niles-Bement-Pond Co., 111 Broadway, New York; Columbia Machine Works and Malleable Iron Co., Brooklyn, and served afloat during the late war as an engineer officer in the United States Naval Reserve Force.

Major Benjamin B. Fogler, management engineer on the staff of Arthur D. Little, Inc., Cambridge, Mass., gave a talk, "Splitting the Engineering Dollar," on March 16, before an affiliation meeting of the engineering and technical societies of the Providence, R. I., district.

G. F. Murray, for many years associated with Naylor & Co., New York, has become associated with Bowring & Co., 17 Battery Place, New York, as manager of the ores and metals department. Bowring & Co., exporters and importers, steamship agents and ship brokers, with extensive connections abroad, have recently entered into an agreement with Naylor, Benzon & Co., Ltd., London, England, under which they will receive, exclusively, the offerings of these well-known factors in European ores and metals. Naylor, Benzon & Co., Ltd., have for many years been large shippers of ores, alloys and iron and steel products to the United States.

Caldwell R. Rosborough has resigned as secretary of Williams-White & Co. and the Moline Forge, Inc.,

Moline, Ill., to become secretary of the Moline Tool Co. Mr. Rosborough has been connected with Williams-White & Co. since May 1, 1900, and will remain on the board of directors.

Frank Nickerson, for about 10 years in the San Francisco office of the Bethlehem Steel Co., has been appointed manager of sales of the Portland, Ore., offices of that company.

Frank H. Colladay has been appointed district sales manager Braeburn Alloy Steel Corporation, in charge of the New York district. Mr. Colladay resigned some weeks ago, as noted in these columns on Jan. 21, as New York manager of sales of the Trumbull Steel Co. He has been affiliated with the steel industry all his life and, as a result, is well known to the steel trade. He is a member of the American Iron & Steel Institute, Engineers' Club, Machinery Club of New York, Indian Harbor Yacht Club, Greenwich, Conn. His New York district sales office is located in the Grand Central Terminal Building.

Burt Fleeger, treasurer, sales manager, and a director of Sivy Steel Casting Co., Milwaukee, has resigned, to become vice-president Oklahoma Steel Castings Co., Tulsa. Mr. Fleeger, who was with the Sivy organization since 1913, has acquired a substantial interest in the Oklahoma company and will be located in Tulsa after March 25. The Oklahoma company is preparing plans for an extensive addition and is purchasing more equipment, which will materially increase its capacity of electric steel castings, of which it is the largest producer in the mid-Continent fields.

Harlan A. Pratt has been appointed manager of the oil and gas engine department of the Ingersoll-Rand Co., New York. Mr. Pratt was connected for many years with the sales department of the Westinghouse Electric & Mfg. Co., later becoming sales manager of the Atlantic Elevator Co., exclusive agent in the East for Westinghouse gearless traction elevators. For the past three years he has been sales manager of the Elevator Supplies Co., Hoboken, N. J. Mr. Pratt is a graduate of Stevens Institute of Technology, and a former director of the American Institute of Electrical Engineers.

Ray E. Williams, formerly associated with the Richmond Iron Works, Richmond Furnace, Mass., the last New England charcoal pig iron stack to go out of business, is in charge of the Rockland Lime Co., Housatonic, Mass., kiln, which has just started on a 24-hr. per day schedule.

Charles R. Riley, general manager Horton Mfg. Co., Bristol, Conn., steel goods, sailed for England on a business trip on Saturday, March 27.

William H. Abbott, J. Morgan Clarke, Alexander Glass, J. J. Holloway, Chester Hubbard, William F. Stifel and Harry C. Whitaker, directors of the Wheeling Steel Corporation whose terms expired, were re-elected at the annual meeting of the stockholders held in Wheeling, March 23.

Francis G. Eppley, for many years superintendent of the plant of the Albaugh-Dover Mfg. Co., Chicago, has been elected a director.

H. B. Gay has been appointed a vice-president of the Electric Storage Battery Co., Philadelphia, manufacturer of Exide batteries. He will continue in charge of sales. Mr. Gay, who is a graduate of Cornell University, entered the employ of the company in June, 1901, as manager of the Baltimore office. In May, 1903, he was transferred to Cleveland as manager of that branch. After serving in that capacity until March, 1920, he was transferred to the factory at Philadelphia, as acting sales manager. Four months later, he was appointed to that position permanently.

O. L. Holcombe has been appointed district manager for the Philadelphia office, to represent the Clark Controller Co., Cleveland. He will open the district office in the Atlantic Building.

H. C. Graton, one of the founders of the Graton & Knight Mfg. Co., Worcester, Mass., maker of belts and other leather products, who is now 95 years of age, is helping to celebrate the diamond jubilee of that business. Despite his approach to the century mark, Mr. Graton is unusually active and makes frequent visits to the plant which he founded. The business was established by H. C. Graton and Joseph A. Knight in 1847.

Ross H. McMaster was elected president of the Steel Co. of Canada, Ltd., Hamilton, Ont., to fill the vacancy created by the death about a month ago of Robert Hobson. Harry Champ, secretary-treasurer, becomes vice-president and Homer M. Jacques, manager of Eastern points, was elected to the board. The appointment of Mr. McMaster as president was not unexpected. He was formerly vice-president of the company. He is among the foremost of the younger Canadian industrial executives, as his appointment to the board of the Canadian Pacific Railway some time ago indicated.

Thomas C. Adams, formerly manager of the Manville-Jenkes Mills at High Shoals, N. C., has resigned that position to become sales manager of the Ferguson Gear Co., Gastonia, N. C.

Theodore Gruterling, of the iron and steel exporting house of Gruterling & Co., Antwerp, Belgium, has been visiting Pacific Coast cities studying market conditions there.

J. F. Rogers, chief engineer and manager, gas producer department, Wellman-Seaver-Morgan Co., Cleveland, will address the Cleveland section of the American Society of Mechanical Engineers, at the Hotel Winton, that city, April 6, on mechanical gas producers.

E. C. Collins has resigned as president of the Crucible Steel Co. of America. It is probable that the office will remain unfilled until after the annual meeting of the company in the latter part of April.

George W. Barrett has assumed the general managership of the Barrett Machine Tool Co., Inc., Meadville, Pa., in succession to his father, the late James O. Barrett, one of the founders of the company.

Thomas D. Graham, who has been attached to the New York office of the Republic Iron & Steel Co., has resigned to become Cleveland district sales manager Reading Iron Co.

David Hale, president Springfield Foundry Co., Springfield, Mass., and Mrs. Hale will start soon after April 1 for Europe, where they will spend five or six months in England, Ireland, Scotland and on the Continent.

W. Wuthenow, president Republic Rolling Mill Corporation, Chicago, has resigned, effective April 1. Mr. Wuthenow was general superintendent of western mills for the Republic Iron & Steel Co. up to the time that the East Chicago mill was sold to its present owners.

OBITUARY

JOHN J. MEEHAN, formerly vice-president of the James A. Brady Foundry Co., Chicago, died March 26, at the age of 65 years. When Mr. Meehan lost his eyesight several years ago he was superintendent of the Brady plant. His injury was believed to have ended his usefulness in that capacity and he was made switch-board operator. But Mr. Meehan, with all the details of the business in his head, soon became so valuable to the president that before long he was directing the work of the foundry again.

J. M. GARVIN, vice-president and general manager Rock Run Iron & Furnace Co., Rock Run, Ala., died March 24 at Rome, Ga. He was born in Dutchess County, New York. The blast furnace of his company was at one time operated by the Bass Foundry & Machine Co., Rock Run, Ala., of which he was at that time second vice-president. The one stack, built in 1873, was rebuilt in 1907. It operated on charcoal pig iron for car wheels and castings and had an annual capacity of 18,000 tons.

PHINEAS F. PARSONS, for more than 60 years connected with the brass industry in New England, died at his home in Providence on March 25, following a brief illness of pneumonia. He was born in Northampton, Mass., Oct. 8, 1835.

JOHN W. FARR, advertising manager McKinney Mfg. Co., Pittsburgh, died at his home in Bellevue, Pa., March 26, following a brief illness of pneumonia. The son of William C. Farr, president McKinney Mfg. Co., he was born in Allegheny, Pa., April 14, 1890. He had been associated with the company for 16 years, the last 10 years as advertising manager. He received his education at Bethany College, Bethany, W. Va., and the University of Pittsburgh.

HERBERT W. CHENEY, for 22 years associated with the Allis-Chalmers Mfg. Co., Milwaukee, and an elec-

trical engineer of international note, died at his home in Milwaukee on March 23 after an illness of two months. He was 54 years of age. Mr. Cheney was best known in power plant development. A year ago he spent some time in Europe investigating the possibilities of a new type of oil circuit-breaker and upon his return organized a department at Allis-Chalmers for its manufacture for American use.

CHARLES D. HITZ, an assistant in the general purchasing department of the Pennsylvania Railroad at Philadelphia, who was well known to sellers of steel, died suddenly Saturday, March 13, of heart failure, while on his way to his home at Haddonfield, N. J.

HORACE C. HIDES, general manager Thomas Firth & Sons, Inc., Hartford, Conn., died on March 19, following an operation and brief illness. He was born in England and came to this country as a representative of William Jessop & Sons, Sheffield, with whom he was associated for over 15 years. He became American representative of Thomas Firth & Sons, Ltd., in 1921.

HENRY FOLLAND, a director of George & Richard Thomas, Ltd., Walsall, England, and a member of the Iron and Steel Institute since 1910, died at the age of 47 on March 24, while in Cairo, Egypt. His home was in Glanamman, Carmarthenshire, Wales.

KEITH DONALDSON, New York district representative of the Lebanon Iron Co., Lebanon, Pa., died of a heart attack, March 23, at his home, 555 Park Avenue, New York. Mr. Donaldson, who was 49 years of age, was a nephew of the late John D. Ormrod, president of the Donaldson Iron Co., who died Feb. 23.

The Sharon Steel Hoop Co., Sharon, Pa., is developing a program involving the improvement of its property at Sharon. This year the company plans to electrify two rolling mills, the 8-in. and 10-in. units, construct a central gas house, install two boilers and erect a boiler house. Changes are to be made, also, in the 90-ton open-hearth furnaces, making possible the tapping of 100-ton heats. Minor improvements will be made to the blast furnace plant at Lowellville.

Continental Prices Develop Weakness

Only Pig Iron Retains Firmness—Germany to Sell Pig Iron and Steel to France—Rail Syndicate Becomes Operative April 15

(By Cable)

LONDON, ENGLAND, March 29.

THE market is dull on the approach of the Easter holidays and the uncertain coal situation. Cleveland pig iron is steady but other makers are willing to shade prices. Consumers, however, are disinclined to make commitments. Continental foundry and forge iron are quoted well below British grades but only small tonnages are obtainable. Hematite continues quiet with an undertone of weakness. Foreign ore is still dull with Bilbao Rubio nominally 21s. to 21s. 6d. c.i.f. Tees.

Finished steel inquiry has improved but substantial orders are still scarce. The Steel Manufacturers' Association has revived price control on plates and shapes for domestic consumption and on plates for export. On foreign business the association is quoting plates at £7 per ton f.o.b. Swan, Hunter & Wigham Richardson, Ltd., have secured an order for a 20,000-ton motor-driven liner from the Shaw Savill company.

TO SELL IRON TO GERMANY

Agreement Reported That Mills Will Buy French Semi-Finished Steel and 200,000 Tons of Pig Iron Yearly

PARIS, FRANCE, March 12.—Following the heavy buying of the active period last fall and winter, consumers are so well stocked that they are not inclined to make further purchases until present supplies have been somewhat reduced. In addition both producers and consumers are holding back in expectation of higher costs depending upon the extent of taxation that will be ultimately imposed and which will result in a rise of prices as costs advance. Export business is quiet and considerably curtailed by the lower prices quoted by German mills, especially on steel products.

Among the numerous national and international agreements being made at present among various

Tin plate is quiet but prices are steady. Galvanized sheets are weak with sales restricted to small lots. Black sheets continue dull with prices unchanged.

Continental markets are demoralized by a further decline of the French franc and business is difficult to negotiate. Merchants are quoting lower prices, while mills are granting small concessions. Merchant bars have been sold out of stock at £5 2s. 6d. f.o.b., while mills have sold sheet bars at £4 11s. f.o.b. It is reported that the formation of the International Rail Makers Association is still incomplete, but ratification is expected about April 15. The Ruhr Steel Trust is expected to materialize April 1. In Germany the Stahlwerk Becker is blowing out its Reinholdhutte furnace about the middle of April. There were 80 German furnaces in blast in February. In Luxemburg Arbed has blown in a second furnace at Aachenerhutte and preparations have been made to blow in a third. The remaining two are to be dismantled and replaced by two modern units.

branches of the iron and steel industry, is the report of an agreement between the representatives of the German iron and steel industry and French producers for the supply of a large tonnage of pig iron and semi-finished products to the Roheisenverband (Pig Iron Association) over a period of five years. These supplies, totaling about 200,000 tons a year of pig iron, would come from Lorraine and Luxemburg furnaces, according to the report. In addition, French phosphoric iron producers and German hematite iron producers would agree not to sell into each others territory.

Pig Iron.—Activity is showing a distinct decrease and foundry consumers, well stocked as a result of recent heavy purchasing, may not find it necessary to use any of the 10,000 tons of supplementary tonnage, which they recently urged the furnaces to place at their disposal for March. The export market continues quite firm, largely as a result of the recent agreement of French, Belgian and Luxemburg producers, which standardizes qualities, terms of sale and export prices.

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.86 per £ as follows:

Durham coke, del'd..	£0 19s.	to £0 19½s.	\$4.62	to \$4.73
Bilbao Rubio ore†...	1 1½		5.22	
Cleveland No. 1 fdy...	3 12½	and 3 13*	17.62	and 17.74*
Cleveland No. 3 fdy...	3 10	and 3 10½*	17.01	and 17.13*
Cleveland No. 4 fdy...	3 9	and 3 9½*	16.77	and 16.88*
Cleveland No. 4 forge	3 8	and 3 8½*	16.52	and 16.65*
Cleveland basic	3 10	and 3 10½*	17.01	and 17.13*
East Coast mixed	3 16½	to 3 17	18.59	to 18.71
East Coast hematite...	4 19		24.06	
Ferromanganese	15 10		75.33	
*Ferromanganese	14 5	to 14 10	69.25	to 70.47
Rails, 60 lb. and up...	6 15	to 7 5	32.80	to 35.24
Billets	6 0	to 7 10	29.16	to 36.45
Sheet and tin plate				
bars, Welsh	6 5		30.38	
Tin plates, base box...	0 19½	to 0 19½	4.68	to 4.75
Black sheets, Japanese				
specifications.	14 12½		71.08	
			C. per Lb.	
Ship plates	7 0	to 7 10	1.52	to 1.62
Boiler plates	11 0	to 11 10	2.39	to 2.49
Tees	7 2½	to 7 12½	1.55	to 1.68
Channels	6 7½	to 6 17½	1.38	to 1.48
Beams	6 2½	to 6 12½	1.32	to 1.43
Round bars, ¾ to 3 in.	7 12½	to 8 0	1.65	to 1.76
Steel hoops	10 10	and 11 0*	2.28	and 2.39*
Black sheets, 24 gage	11 5	to 11 10	2.35	to 2.49
Galv. sheets, 24 gage.	15 12½	to 16 0	3.39	to 3.47
Cold rolled steel strip,				
20 gage	18 0		3.91	

*Export price.

†Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

Foundry pig iron: (a)				
Belgium	£3 5s.		\$15.80	
France	3 5		15.80	
Luxemburg	3 5		15.80	
Basic pig iron: (a)				
Belgium	3 1½		14.94	
France	3 1½		14.94	
Luxemburg	3 1½		14.94	
Coke	0 18		4.37	
Billets:				
Belgium	4 7	to £4 10s.	21.26	to \$21.87
France	4 7	to 4 10	21.26	to 21.87
Merchant bars:			C. per Lb.	
Belgium	5 3½	to 5 10	1.14	to 1.21
Luxemburg	5 3½	to 5 10	1.14	to 1.21
France	5 3½	to 5 10	1.14	to 1.21
Joists (beams):				
Belgium	4 16½	to 5 0	1.06	to 1.10
Luxemburg	4 16½	to 5 0	1.06	to 1.10
France	4 16½	to 5 0	1.06	to 1.10
Angles:				
Belgium	5 2	to 5 4	1.12	to 1.16
½-in. plates:				
Belgium	5 18	to 6 2	1.30	to 1.34
Germany	5 18	to 6 2	1.30	to 1.34
¾-in. ship plates:				
Belgium	5 9	to 5 11	1.20	to 1.22
Luxemburg	5 9	to 5 11	1.20	to 1.22
Sheets, heavy:				
Belgium	6 3	to 6 4	1.35	to 1.37
Germany	6 3	to 6 4	1.35	to 1.37

(a) Nominal.

At present foundry for export is on a basis of 342.50 to 347.50 fr., Belgian (\$13.50 to \$13.70) per metric ton, f.o.b. Antwerp. The agreement of hematite iron producers, although not yet signed, is virtually renewed and furnaces are offering a total of 40,000 tons for April and 20,000 tons for May to domestic consumers.

Semi-Finished Material.—While but little new business has been booked recently, mills are not yet particularly eager for tonnage, still being well covered for several weeks to a month or more ahead. Prices show but little change. Billets are quoted at £4 8s. to £4 8s. 6d. (\$21.38 to \$21.50), f.o.b. Antwerp; blooms at about £4 (\$19.44) and slabs at £4 13s. 6d. to £4 14s. (\$22.70 to \$22.82) per ton, f.o.b. Antwerp.

Finished Material.—Activity is largely confined to numerous inquiries to test the market. Bar prices have eased off slightly. German competition is a considerable factor in the general weakness of the market, particularly in export business. Beams range from £4 16s. 6d. to £4 17s. (\$23.45 to \$23.57); angles £5 2s. to £5 4s. (\$29.16 to \$29.65), and bars from £5 4s. 6d. to £5 5s. (\$29.77 to \$29.90) per metric ton, all f.o.b. Antwerp for export. In competition to these prices German sellers offer bars at £5 4s. (\$29.16) and beams at £4 16s. (\$23.33) per metric ton.

Sheets.—Demand for light gages continues heavy, but the medium and heavy gages have declined in activity. German competition in foreign markets is weakening export prices slightly. Thomas sheets of 5 mm. and heavier are quoted at £5 8s. 6d. to £5 9s. (\$26.35 to \$26.50), and medium gage sheets at £5 18s. 6d. to £5 19s. (\$28.80 to \$28.92) per metric ton, f.o.b. Antwerp.

BELGIAN PRICES WEAKEN

Continued Decline of the French Franc and German Competition Force Steel Market Down.—Pig Iron Still Firm

ANTWERP, BELGIUM, March 13.—Foreign purchasers of iron and steel, who have been quiet lately show no desire to resume purchasing in the Belgian market and lack of confidence in the future continues general. Offers of mills to accept business at slight concessions are developing but little increase in buying so that the tendency of the market is to gradually settle to lower levels.

The uncertain future of the French franc, the complete return of the Charleroi district mills and increased competition of German sellers, who are quoting lower prices for export, are all contributing to the present depressed situation. In addition, Luxemburg mills with a smaller backlog of business on their books are showing less firmness in their quotations for export.

Probably the general lack of any sizable business has permitted the maintenance of higher prices than the real situation justifies. But the underlying weakness of the market is forcing a gradual downward movement of prices under pressure from buyers, who refuse to meet the mills' price ideas.

Pig Iron.—The depression in other products is by no means reflected in the pig iron market. The higher prices reached during the past few weeks are being maintained without difficulty, particularly in the phosphoric grades. Practically no tonnage is available for export and the price quoted is in most cases about \$16.15 per ton, Antwerp, too high to permit of much business. Domestic demand is still heavy and 360 to 365 fr. (\$14.20 to \$14.40) per ton is a fair range of the market. Hematite is quiet at about 425 fr. (\$19.30) per ton, which is slightly lower than British hematite which has declined to about £4 2s. per metric ton, c.i.f. Antwerp. As Belgian furnaces are not at present producing medium phosphorus iron, recent orders have been going to French and German makers and the Dutch furnace.

Semi-Finished Material.—Prices continue to decline but business is still small, as buyers' offers are still lower than the mills are willing to accept. Blooms are now obtainable at as low as £4 (about \$19.60) per metric ton, f.o.b. Antwerp. Billets, however, show slightly more firmness and mills are maintaining a price of about £4 8s. on desirable specifications with

slightly higher prices on the smaller lots. Slabs are weaker and have declined to a range of £4 13s. to £4 14s. per metric ton, f.o.b. Antwerp.

Finished Material.—Prices of practically all products are registering a gradual decline and no immediate improvement seems to be expected. With their operating rate mounting rapidly, Charleroi mills are showing a considerably greater desire for more tonnage, French and Luxemburg sellers are quoting lower prices and German mills are still lower on prices for export. A few mills are still fairly well provided with orders but except for these points of resistance, weakness is the prevailing condition in the entire market. Current quotations for export are about £5 5s. per metric ton (\$25.75) on soft steel bars; £4 17s. per metric ton (\$23.75) on beams; £5 13s. per ton (\$27.70) on corrugated bars; £5 15s. per ton (\$28.20) on wire rods, and £6 13s. per ton (\$32.60) on steel hoops.

EXPORT TRADE QUIET

Chinese Boycott in Hong Kong Brings Small Orders to United States Mills—Japan Inquires for Rails

NEW YORK, March 25.—A moderate volume of inquiry continues from the Far East, principally from Japanese consumers, although Chinese merchants are the purchasers of occasional lots of material. The Canton district boycott of British manufacturers and British importers occasionally brings some business to American sellers, such as in tin plate, which the merchant is willing to purchase in the United States at higher than the British price and insists upon having shipped direct to the port of Canton and not through the normal port of entry, Hong Kong.

Inquiries for rails continue to be the outstanding feature of Japanese business and award is expected in a few days of two sizable tonnages, one calling for 25 miles of 45-lb. rails (about 1800 tons) for the Kabafuto railroad operating in Saghalien, the other for 40 miles of 60-lb. sections (about 3800 tons) for the Hambi railroad. It is perhaps noteworthy, in view of the report that the official price of the International Rail Makers Association has been set at £6 per ton, f.o.b. mill, that American and Continental quotations on the Hambi railroad tonnage are understood to have figured back to a mill price of close to \$29 per ton. Should the practice of quoting on this higher basis be consistently adhered to by the mills in the association, it is expected that American manufacturers will be in a far more favorable position to compete for export railroad business than for some time.

Current inquiries from Japan for other products continue small and there has been some activity recently in small lot buying of black sheets. An inquiry for tin plate from a Japanese consumer calls for about 3000 base boxes and there is a lot of about 450 tons of channels in the market from a Japanese source. Purchases of light gage black sheets have evidently been made at about \$81 to \$81.50 per ton, c.i.f. Japanese port, despite the fact that British mills are still quoting about \$80 per ton, c.i.f. Japan. Sales of American tin plate to Japanese consumers seem to be out of the question at present with the Welsh tin plate market down to about \$5.25 per base box, c.i.f. Japan, compared with prices 30c. to 40c. per box higher quoted by mills in the United States.

Austrian Mill Reported Part of German Steel Merger

VIENNA, AUSTRIA, March 16.—Recent reports include the Alpin Montan Gesellschaft, the large Austrian steel works, in the new Western Steel Trust in Germany. Under the control of the late Hugo Stinnes the Rhine-Elbe Union in Germany, which included the Gelsenkirchen Bergwerks, Deutsch-Luxemburg A. G. and Bochum Steel Works, acquired an interest in the Alpin Montan Gesellschaft and, according to the reports, these shares will be transferred together with other Rhine-Elbe Union property to the new German steel combination.

Machinery Exports Still Heavy

February About Equal to 1925 Average Month But Much Above February, 1925— Imports Heavy Also

WASHINGTON, March 26.—Exports of machinery in February of the present year valued at \$32,269,707, as against \$34,590,693 in January, and \$22,184,655 in February of last year. For the eight months ended with February, 1926, they were valued at \$261,121,050, compared with \$200,891,000 for the corresponding period of 1925. Exports of all metal-working machinery in February were valued at \$1,294,934, of which power-driven machinery represented \$976,431. Exports of power-driven metal-working machinery listed in THE IRON AGE table totaled 641 units of \$536,690 value in February, as against the revised total of 903, valued at \$590,692, in January.

Imports of machinery in February of the present

year were valued at \$1,469,170, as against \$1,659,971 in the previous month and \$904,075 in February of last year. For the eight months ended with February of the present year machinery imports were valued at \$10,010,793, or almost double the imports for the corresponding period of 1925, with a total value of \$6,437,037. Gains were reflected in each item.

Brazil was the principal country of export for locomotives in February, taking 21, valued at \$545,060, while for the eight months ended with February that country took 53, valued at \$1,201,164. Cuba took one locomotive, valued at \$26,850, in February, and 45, valued at \$925,457, during the eight months. No shipment of locomotives was made to Canada in February but for the eight months that country took 47, valued at \$881,443.

Sewing machines to the number of 6641, valued at \$176,622, were exported to Mexico in February, while for the eight months Mexico took 25,867, valued at \$796,095. The United Kingdom took 2184 sewing machines, valued at \$123,835, in February and 27,087, valued at \$1,103,386, during the eight months. Cuba was the destination of exportation of 4023 sewing machines, valued at \$105,450, in February and 12,682, valued at \$344,761, during the eight months.

The United Kingdom led by far as the principal country of exportation of American typewriters for both February and the eight months' period. King George's attitude in this regard does not seem, as yet, to have borne fruit, although the February figures were below the average of the preceding seven months. In February the number was 4309, valued at \$247,293,

Exports of Power-Driven Metal-Working Machinery

	February, 1926		January, 1926*	
	No.	Value	No.	Value
Engine lathes	18	44,922	58	106,461
Turret lathes	17	52,440	3	2,423
Other lathes	50	78,747	83	96,176
Vertical boring and chucking machines...	8	5,700	9	6,139
Thread cutting and automatic screw machines	41	44,972	47	54,908
Knee and column type milling machines ..	6	15,333	5	28,291
Other milling machines	36	43,353	45	53,045
Gear-Cutting machines.	17	49,368	94	15,383
Vertical drilling machines	30	8,092	20	17,499
Radial drilling machines	5	9,791	2	3,000
Sensitive drilling machines	65	1,046	58	1,461
Other drilling machines	74	8,093	75	24,828
Shapers and slotters..	14	11,476	269	25,309
Planers	2	1,247	2	1,203
External cylindrical machines	171	93,324	43	53,726
Internal grinding machines	29	43,478	43	68,581
Metal-working tool-sharpening machines.	58	25,308	47	32,259
Total	641	536,690	903	590,692

*Figures revised.

Imports of Machinery Into the United States (By Value)

	February		Eight Months Ended February	
	1926	1925	1926	1925
Metal-working machine tools	\$35,875	\$18,351	\$257,929	\$166,871
Agricultural machinery and implements	486,453	293,582	1,880,225	1,483,925
Electrical machinery and apparatus	143,646	141,022	1,632,189	1,141,738
Other power generating machinery..	2,094	584	6,413	5,655
Other machinery..	621,848	265,871	4,884,954	2,612,772
Automobiles and other vehicles except agricultural	179,254	184,665	1,349,083	1,026,076
Total	\$1,469,170	\$904,075	\$10,010,793	\$6,437,037

United States Exports and Imports of Machinery

	Exports of Machinery		Imports of Machinery	
	1925	1926	1925	1926
The year 1924...	\$317,040,424		\$9,711,618	\$8,644,444
1925				
January	28,117,952	803,829	845,986	
February	23,215,776	814,703	707,445	
March	35,962,076	999,237	1,364,930	
April	36,033,980	1,167,099	1,245,634	
May	32,164,865	861,665	1,230,914	
June	28,746,061	935,487	1,003,325	
Fiscal year	338,715,075	10,404,387	10,776,079	
July	32,320,533	905,872	1,188,069	
August	38,768,823	747,912	1,308,372	
September	30,719,842	956,250	989,379	
October	31,271,007	996,557	905,826	
November	30,684,814	876,113	1,007,376	
December	37,933,511	1,448,316	1,155,660	
The year 1925....	385,376,676	11,577,911	13,052,916	
1926				
January	34,590,693	1,659,971	853,276	
February	32,269,707	1,469,170	1,294,934	
Eight months ...	261,121,050	10,010,793	8,702,892	

Machinery Exports from the United States

	(By Value)		Eight Months Ended	
	February, 1926	February, 1925	February, 1926	February, 1925
Locomotives	\$839,982	\$267,932	\$5,409,717	\$5,135,714
Other Steam Engines	111,139	219,296	909,641	1,128,102
Boilers	112,647	147,854	1,225,330	1,211,930
Accessories and Parts	113,837	73,029	1,447,729	1,194,037
Automobile Engines	1,221,489	938,807	7,806,568	4,165,645
Other Internal Combustion Engines	548,502	426,942	4,934,068	4,499,964
Accessories and Parts for	278,617	219,749	2,561,925	2,028,175
Electric Locomotives	477,485	7,863	1,119,897	1,337,963
Other Electric Machinery and Apparatus	422,233	448,521	4,607,225	4,878,878
Excavating Machinery	360,205	175,810	2,628,573	1,410,266
Concrete Mixers	66,418	75,466	970,315	447,031
Road Making Machinery	186,972	75,932	892,531	685,612
Elevators and Elevator Machinery	206,051	99,426	1,381,574	1,249,220
Mining and Quarrying Machinery	962,153	581,531	8,005,390	6,356,592
Oil Well Machinery	1,023,205	555,076	8,352,891	4,170,766
Pumps	564,809	443,729	4,206,814	4,486,476
Lathes	176,109	138,080	1,863,078	926,760
Boring and Drilling Machines	27,022	51,029	327,752	463,565
Planers, Shapers and Slotters	15,653	34,633	230,355	293,694
Bending and Power Presses	30,213	12,368	389,548	548,320
Gear Cutters	49,368	98,980	451,805	343,565
Milling Machines	58,686	44,018	935,334	595,100
Thread Cutting and Screw Machines	44,972	32,807	748,654	366,505
Punching and Shearing Machines	72,606	5,793	155,391	86,929
Forging Machinery	80,913	12,667	251,232	166,150
Sharpening and Grinding Machines	181,658	183,345	575,536	1,337,565
Other Metal Working Machinery and Parts of	318,503	266,695	2,968,192	2,771,265
Textile Machinery	823,883	798,324	8,323,187	6,029,968
Sewing Machines	758,959	464,898	5,574,315	4,686,712
Shoe Machinery	99,026	119,297	826,076	1,029,722
Flour-Mill and Gristmill Machinery	56,559	47,506	542,031	485,373
Sugar-mill Machinery	217,449	156,995	6,354,941	7,318,373
Paper and Pulp Mill Machinery	169,530	84,427	1,490,636	1,131,720
Sawmill Machinery	95,719	84,550	574,037	494,448
Other Woodworking Machinery	105,646	88,018	931,696	837,816
Refrigerating and Ice Making Machinery	322,320	171,212	1,931,760	1,235,860
Air Compressors	232,890	348,336	2,691,051	1,950,030
Typewriters	1,453,144	1,448,129	11,996,640	10,443,368
Power Laundry Machinery	112,255	82,239	655,018	598,768
Typetting Machines	286,435	283,357	2,366,075	2,317,995
Printing Presses	852,738	497,640	3,700,163	3,306,806
Agricultural Machinery and Implements	8,731,883	4,435,309	59,091,073	35,865,317
All Other Machinery and Parts	9,325,362	7,513,950	89,151,695	70,839,475
Total	\$32,269,707	\$22,184,655	\$361,121,050	\$200,891,000

while for the eight months the number was 43,932, valued at \$2,411,299. France ranked second for both periods, taking 2509 typewriters, valued at \$129,522, in February and 19,091, valued at \$1,100,810, during the eight months. Mexico took 2185, valued at \$119,791, in February and 9381, valued at \$502,396, during the eight months.

Harvesters and binders to the number of 3835, valued at \$609,897, were exported to France in February, while for the eight months the number shipped

was 6675, valued at \$1,108,702. The United Kingdom took 966 harvesters and binders, valued at \$171,719, in February and during the eight months took 1704, valued at \$271,360.

Printing presses exported to the United Kingdom in February numbered 36, with a value of \$227,959 and for the eight months the number was 286, valued at \$996,929. Canada took 22 printing presses, valued at \$312,677, in February and during the eight months took 182, valued at \$737,087.

Production of Pig Iron in the United States in 1925

PRODUCTION OF PIG IRON BY GRADES, 1909-1925.

Years	Basic.	Bessemer.	Foundry.	Malleable.	Forge.	All other.	Total. Gross tons.
1909.	8,250,225	10,557,370	5,322,415	658,048	725,624	281,789	25,795,471
1910.	9,084,608	11,245,642	5,260,447	843,123	564,157	305,590	27,303,567
1911.	8,520,020	9,409,303	4,469,940	612,533	408,841	229,910	23,649,547
1912.	11,417,886	11,664,015	5,073,873	825,643	469,183	276,337	29,726,937
1913.	12,536,693	11,590,113	5,220,343	993,736	324,407	300,860	30,966,152
1914.	9,670,687	7,859,127	4,533,254	671,771	361,651	235,754	23,332,244
1915.	13,093,214	10,523,306	4,843,899	829,921	316,214	309,659	29,916,213
1916.	17,684,087	14,422,457	5,553,644	921,486	348,344	504,779	39,434,797
1917.	17,671,662	13,714,732	5,328,258	1,015,579	345,707	545,278	38,621,216
1918.	18,646,174	13,024,966	5,145,260	1,117,914	393,932	726,398	39,054,644
1919.	14,494,131	9,975,934	4,916,758	1,009,049	271,286	348,206	31,015,364
1920.	16,737,722	12,062,084	5,957,782	1,310,951	318,048	539,400	36,925,987
1921.	7,753,071	5,595,215	2,568,136	457,340	112,748	201,616	16,688,126
1922.	13,841,367	7,813,203	3,976,431	1,051,495	214,210	323,198	27,219,904
1923.	19,795,590	11,677,509	6,470,013	1,571,064	327,430	519,540	40,361,146
1924.	15,999,012	8,172,297	5,623,124	973,158	255,961	382,238	31,405,790
1925.	19,667,380	9,419,461	5,410,217	1,553,636	240,652	409,220	36,700,566

PRODUCTION OF PIG IRON BY STATES, 1921-1925.

States.	1921.	1922.	1923.	1924.	1925.
Maine, Mass., Conn....	2,142	1,084	1,309	.....	.....
New York, New Jersey....	968,660	1,772,325	2,951,810	2,013,673	2,187,733
Pennsylvania.....	6,252,766	9,731,788	14,804,620	11,068,979	12,523,485
Maryland.....	147,189	366,967	529,606	558,420	705,377
Virginia.....	67,239	49,024	276,874	97,739	125,325
Alabama.....	1,207,408	2,230,619	2,797,190	2,773,825	2,836,023
West Va., Kentucky....	264,759	460,311	702,454	568,031	651,983
Tennessee.....	19,479	123,907	250,982	137,991	110,232
Ohio.....	3,799,613	6,484,162	9,347,960	7,415,039	8,862,646
Illinois.....	1,612,033	2,625,244	3,839,063	2,600,864	3,604,255
Indiana, Michigan.....	1,893,611	2,726,727	3,813,125	3,350,385	4,119,811
Wisconsin, Minnesota....	226,863	381,030	724,717	357,271	468,479
Mo., Iowa, Colo., Utah, Washington.....	226,364	266,716	321,436	403,573	505,217
Total... Gross tons.	16,688,126	27,219,904	40,361,146	31,405,790	36,700,566

PRODUCTION OF PIG IRON BY STATES, 1924-1925, SHOWING INCREASE OR DECREASE BY STATES.

States.	Production—Gross tons.				
	1924.	Per cent.	1925.	Per cent.	Increase.
Pennsylvania.....	12,523,485	34.12	11,068,979	35.24	1,454,506
Ohio.....	8,862,646	24.15	7,415,039	23.61	1,447,607
Indiana, Michigan....	4,119,811	11.22	3,350,385	10.67	769,426
Illinois.....	3,604,255	9.82	2,600,864	8.28	1,003,391
Alabama.....	2,836,023	7.73	2,773,825	8.53	62,198
New York, New Jersey	2,187,733	5.96	2,013,673	6.41	174,060
Maryland.....	705,377	1.92	558,420	1.78	146,957
West Va., Kentucky....	651,983	1.78	568,031	1.81	83,952
Mo., Iowa, Colo., Utah	505,217	1.38	463,573	1.48	41,644
Wisconsin, Minnesota..	468,479	1.28	357,271	1.14	111,208
Virginia.....	125,325	.34	97,739	.31	27,586
Tennessee.....	110,232	.30	137,991	.44	*27,759
Total.....	36,700,566	100.00	31,405,790	100.00	5,294,776

* Decrease.

PRODUCTION OF COLD AND HOT AND WARM BLAST CHARCOAL PIG IRON, 1921-1925.

Kinds of pig iron.	1921.	1922.	1923.	1924.	1925.
Cold blast.....	350	.....	.....	.....	1,014
Hot and warm blast....	94,380	224,731	251,177	212,710	195,150
Total..... Gross tons.	94,730	224,731	251,177	212,710	196,164

PRODUCTION OF PIG IRON BY GRADES, 1924-1925, SHOWING INCREASE OR DECREASE BY GRADES.

Grades.	1925.	Per cent.	1924.	Per cent.	Increase.	Per cent.
Basic.....	19,667,380	53.59	15,999,012	50.94	3,668,368	22.93
Bessemer and low phos....	9,419,461	25.67	8,172,297	26.02	1,247,164	15.26
Foundry and ferro-silicon.	5,410,217	14.74	5,623,124	17.90	*212,907	*3.79
Malleable.....	1,553,636	4.23	973,158	3.10	580,478	59.65
Forge.....	240,652	.65	255,961	.82	*15,309	*5.98
Spiegeleisen.....	325,784	.89	107,066	.34	218,718	203.42
Ferro-manganese.....	194,243	.52	194,243	.62	.....	.....
All other.....	83,436	.23	80,929	.26	2,507	3.10
Total.....	36,700,566	100.00	31,405,790	100.00	5,294,776	16.86

* Decrease.

PIG IRON MADE FOR SALE BY GRADES IN 1925.

States.	Basic.	Bessemer.	Foundry.	Malleable.	Forge.	All other.	Total. Gross tons.
New York, N. J.	98,031	122,187	709,259	194,443	.....	11,911	1,135,831
Maryland.....	476,156	389,196	911,614	89,015	10,807	137,847	2,014,635
Pennsylvania.....	70,851	9,480	1,528,522	.....	34,315	31,408	1,674,576
Ohio.....	845,980	12,940	745,973	343,880	18,539	50	1,967,371
Ind., Illinois.....	443,499	24,448	419,974	390,363	.....	.....	1,278,284
Michigan, Wis., Minn., Iowa, Colo., Utah.....	16,812	.....	593,388	305,551	.....	4,884	920,635
Total.....	1,951,329	558,251	4,908,730	1,323,252	63,661	186,109	8,991,332

METHODS BY WHICH ALL PIG IRON WAS CAST OR DELIVERED IN 1925.

States.	Molten condition.	Sand cast.	Machine cast.	Chill cast.	Direct castings.	Total. Gross tons.
New York, New Jersey, Maryland.....	1,420,582	69,287	1,335,864	67,246	1,131	2,893,110
Pennsylvania.....	9,144,216	144,406	2,997,789	233,560	3,514	12,523,485
Virginia, West Va., Ala., Ky., Tenn.....	1,638,255	1,373,932	428,282	275,777	7,317	3,723,563
Ohio.....	5,729,655	94,874	3,025,484	.....	12,633	8,862,646
Ind., Ill., Mich., Wis., Minn., Iowa, Colo., Utah.....	5,907,559	163,205	2,719,525	.....	7,473	8,697,762
Total.....	23,740,267	1,844,704	10,506,944	576,583	32,068	36,700,566

TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

	191	232	143	375	\$19,048,618	17,455,784	36,504,402
Coke*.....	191	232	143	375	\$19,048,618	17,455,784	36,504,402
Anthracite.....	0	0	1	1	.....	.....	.....
Charcoal.....	7	6	13	19	97,132	99,032	196,164
Total.....	198	238	157	395	\$19,145,750	17,554,816	36,700,566

* Includes pig iron and ferro-alloys made with electricity, electricity and coke, etc.

† Includes mixed anthracite and coke pig iron.

‡ Revised.

PIG IRON MADE FOR SALE OR FOR USE OF MAKERS IN 1925.

Grades.	For sale.	For maker's use.	Total. Gross tons.
Basic.....	1,951,329	17,716,051	19,667,380
Bessemer and low-phosphorus....	558,251	8,861,210	9,419,461
Foundry, including ferro-silicon....	4,908,730	501,487	5,410,217
Malleable.....	1,323,252	230,384	1,553,636
Forge or mill.....	63,661	176,991	240,652
Ferro-manganese.....	146,418	179,366	325,784
Spiegeleisen.....	39,691	43,745	83,436
All other grades.....	.....	.....	.....
Total..... Gross tons.	8,991,332	27,709,234	36,700,566

(These figures were compiled by the American Iron and Steel Institute.)

Reducing Waste in Machine Shop

(Continued from page 935)

of the degree of accuracy called for on some tool work. Mr. Pennock called attention to a tool designed to make what is known as the "multiple bank terminal strip" which is used in automatic telephone exchanges. This part is made of brass 0.020 in. thick. The finished part is approximately 3 ft. long and looks like the backbone of a fish, with 129 holes perforated in the spine. There are 32 separate die sections, punch details, and shedder details on 1½-in. centers, which must be interchangeable and held within close limits, since the total tolerance for the entire tool is only plus or minus 0.001 in. This degree of accuracy is necessary in order to meet the requirements of the part to be made, the tolerance for which is plus or minus 0.002 in. over the entire length. A clearance of 0.0005 in. is allowed between the punch and die opening, whereas the perforator openings are only 0.0002 in. larger than the perforators. By dividing the maximum tolerance allowed on the entire length of tool by 32, it will be seen that each one of the sections must be held within very close limits. The cost of this die was approximately \$12,000, and if one man were to attempt its construction according to the practice of 20 years ago, it would require about 3½ years to complete.

In summing up, Mr. Pennock pointed out the advantages of specialization as follows:

1. Lower cost of tools.
2. Less time required to build a tool.
3. High-grade tool maker confined to work calling for a high degree of skill.
4. Minimum amount of machinery required.
5. Greater opportunity to standardize parts and operations, thus controlling output.
6. Making the proper kind of tool insured by proper consideration of tool costs, annual requirements, etc.

There Is No All-Purpose Tool Steel

There is no all-purpose steel, according to J. B. Mudge, metallurgist Hawthorne Works, Western Electric Co., who delivered a paper on the selection of tool steel. Specifications are essential if uniformity of material is to be had, and they should be written to cover a reasonable range of limits and should give the steel maker full information on chemical and physical requirements as well as a brief outline of the purpose for which the steel is to be used. Further assurance of uniform and satisfactory raw material can be had by buying from makers who have established records of fair dealings and who are equipped, both with personnel and machinery, to turn out the desired product.

A comprehensive color scheme of identification has been worked out by the Western Electric Co., and the manufacturer is required to apply it throughout the full length of each piece shipped. The routine method of inspection upon the receipt of material will vary according to the importance of the work and the amount of money which the size of the shop can set aside for this purpose.

Tool Steel Tests in a Small Shop

Mr. Mudge suggested that even the small shop can afford and should apply: (1) The visual test; (2) hot acid, etch and microscopic tests, and (3) the Brinell test. Of these three tests, the second one named is the most important. It will also be well at times to check the carbon or chief alloy contents, according to Mr. Mudge.

Much spoilage results from improper heat treatment. In this work the human element is an important factor and cannot wholly be eliminated, although the installation of signals and temperature recording devices greatly assist in obtaining uniformity of product.

Waste and the Human Element

No discussion of waste in industry can be complete without touching upon the problems of unemployment, accident, sickness and intelligence, in the opinion of George Hodge, industrial relations department, International Harvester Co., Chicago.

Heavy Time Loss from Accidents

Not counting labor turnover, each of our 12,800,000 industrial wage earners loses 20 days a year, on the

average, through involuntary unemployment. As the result of accidents in the United States in 1924, 86,000 persons were accidentally killed and 2,000,000 temporarily or permanently disabled. Statistics show that, out of every 100,000 blind persons in the United States, 15,000 lost their sight through industrial accidents. Industry well knows that almost all its sight-destroying accidents can be prevented by the wearing of goggles.

Experience in accident prevention has proved that management can go only so far in guarding its machinery, but that the best results come from the earnest, ceaseless and intelligent cooperation of every man on the job.

Illness a Great Source of Waste

Sickness prevention is a problem equally as capable of solution as accident prevention, but vastly more important. Generally speaking, sickness prevention is a problem of the employee's life away from the job and outside of working hours, and the burden of solution must therefore lie chiefly upon him. Still, management has a definite and important interest in sickness prevention, because illness is the chief cause of absenteeism. Even in the most favored industrial groups, time lost on account of sickness is not less than five days per year per man, and in many instances this figure runs as high as 12 to 15 days per year per man. The average is probably seven or eight days.

Good Layout and Intelligence of Employees Important

Mr. Hodge then pointed out that productive efficiency calls for the best possible layout of the best equipment working on the best materials, and under such market and sales conditions that production can be maintained in an even, regular flow. However, the highest possible efficiency will still be unattainable unless the operator of a machine is not merely the best man obtainable at the wages which can be paid, but is a satisfied man, one who not only comprehends clearly what he is doing but also has a clear vision of why he is doing that particular thing in that particular way, a man who understands and properly values the importance of his work in the completed artifact and the importance of that artifact to the man who is going to use it.

Another kind of industrial waste, that is none the less serious because its result cannot be weighed, counted or measured, is the potential waste of intelligence that exists in any shop or business, big or little; the waste of constructive ideas that "die aborning" before they can reach administrative attention; the waste of undeveloped or undirected thoughts in which the seeds of progress exist in untold quantity but never germinate.

Too Much Dependence on Superintendent

Col. Hugo Diemer, LaSalle Extension University, Chicago, pointed out that in too many shops the entire question of production management is still turned over to a superintendent, whose time is fully occupied with supervisory duties. There is often no tie-up between the superintendent and the general management. Too many industrial officials still consider the shop superintendent as a sort of Indian medicine man, a being who has occult power. The old-time superintendent likes to be thought of in this way; his attitude suggests the possession of certain knowledge that no one else can understand. On the other hand, the engineering type of mind feels called upon to get and present facts and make them understandable.

It was suggested that the following remedies appear obvious ones for reduction of managerial wastes in machine shops:

1. An awakened interest in investigations in industrial and management engineering.
2. Further development of trade associations.
3. Exercise of better discretion and judgment in the employment of consultation service.
4. Recognition of the need for permanent staff of competent and trained assistants.
5. Recognition by engineers that they must tie up designs, specifications and tests with materials, stores, planning, standardization and control.

Heavy Savings in Reclaimed Scrap

A saving of \$322,539.55 was made last year at its Corwith, Ill., reclamation plant by the Atchison, Topeka

& Santa Fe Railway, according to Robert K. Graham, division storekeeper. In terms of weight the scrap reclaimed amounted to 8686 tons of material. The net saving on material sorted from scrap that did not need repairs and was shipped back on the road on requisitions was \$72,727.26. From June, 1924, until June, 1925, there was repunched and shipped on requisitions about 3,000,000 tie plates at the cost of about 1c. each. These answered the same purpose as new plates costing about 19c. each, making a saving of \$191,284.37. If these had been sold as scrap at the best market price, the railroad would have received \$8,000. Hence the net saving was \$183,284.37.

The Navy and the Steel Industry

(Concluded from page 915)

plant many of the forgings in use. As the result a high grade of cast steel was developed and castings of great weight were made.

Special Machinery and Research Required

To satisfy ordnance requirements in the manufacture of enormous gun forgings, thick, heavy armor plate, and large steel castings special machinery had to be designed. Naturally, the cost of development was borne by the Bureau of Ordnance, but in the end the nation as a whole benefited. Hydraulic forging machinery with high-power hydraulic pumps was developed. Machine shop tools of larger size than had ever before been attempted in this country were made. Powerful traveling cranes and conveying machinery were made and first used in connection with the manufacture of ordnance material. Means of casting and handling large unit masses of steel in ingots were developed. Large plate rolling mills for the armored decks of battleships were placed in operation.

Chemical research was necessary in the development of steel for armor, projectiles and guns. This has not only benefited the Navy in the improvement of its ordnance material, but has given to the nation steels which otherwise would have been necessarily retarded in development.

With a view to producing metal-cutting tools which

would economically machine heavy armor plate and gun forgings, the Bethlehem Steel Co. developed the well-known "Taylor-White" process of treating high-speed steel. This steel is now used in metal-cutting tools that, by many, are considered as having revolutionized machine-shop practice throughout the entire world.

In research work, in the chemical and physical characteristics and properties of steels, and in the installation of heavy equipment necessary to manufacture heavy ordnance material, it may be safely stated that no steel plant would have ventured the extensive pioneer work without the prospect of sufficient Government work to justify it. In past years there was not enough demand for large commercial products of size sufficient to pay a profit on the investment, regardless of whether or not some of these products are somewhat in demand. However, since the requirements of the Navy have resulted in the design and manufacture of heavy equipment, the commercial world has been able to profit.

Heavier Rolling Stock Developed

The demand of the Navy for suitable ordnance material has made its presence felt in the field of transportation. The ever-increasing weights severely taxed the capacity of railroads, and cars have been designed, outgrown and redesigned, primarily for the purpose of transporting guns of large caliber. In this field the Bureau of Ordnance has been the pioneer. At the time when cars of 80,000 lb. capacity were in common use, special cars had to be constructed of greater capacity, to transport naval guns from the steel works to the navy yards. Cars of 200,000 lb. capacity have been built for naval purposes, and the average capacity of ordinary freight cars has gradually increased, to the cars of 120,000 lb. capacity of the present day.

Acid open-hearth steel is generally considered more suitable for gun and other high-grade forging than basic steel. The American ore used for the manufacture of pig iron necessary for making acid steel has not been plentiful in this country. As a result of the shortage of suitable American ore, the Bethlehem Steel Co. opened mines in Cuba and South America and built steamers to carry ore from the mines. That company now has in operation steamship lines which not only carry ore, but are used for other commercial purposes, a valuable addition to the American merchant marine.

NEW TRADE PUBLICATIONS

Punches and Shears.—Beatty Machine & Mfg. Co., Hammond, Ind. Thirty-two page catalog giving essential measurements and capacities for power punches; combination punch and shears; double end punches; double end punch and shears; beam punches; flush front shears; plate shears; gate shears; multiple punches; vertical bulldozers; a combination machine equipped with punching, shearing and coping tools; and portable floor cranes.

Metal Ceilings.—Canton Art Metal Co., Canton, Ohio. Catalog featuring repressed bead and die punched nail hole construction, for distribution among dealers, master sheet metal workers, etc. The book contains 146 pages, 8 1/4 x 9 1/4 in., and is highly useful as well as being a work of art.

Torsion Balance.—L. Oertling, Ltd., Turnmill Street, London, England. A pamphlet of 20 pages describes the "Eötvös" torsion balance which is reported to have been successfully used in various parts of the world for the location of subterranean deposits of minerals and oil. The pamphlet is well illustrated and gives a full description of the principles involved.

Electric Furnaces.—Automatic & Electric Furnaces, Ltd., 173-175 Farringdon Road, London, England. An eight-page pamphlet describes various types of Wild-Barfield automatic electric hardening furnaces, internally heated electric furnaces, high-speed steel furnaces and air tempering ovens.

Heat-Treating Apparatus.—Stanley Rockwell Co., 66 Trumbull Street, Hartford, Conn. Bulletin 2602 describes the "volcrit method" of heat treatment by the

use of a Rockwell dilatometer. Later details concerning the operation and results of the use of this apparatus are presented than was contained in the description of the apparatus which appeared in THE IRON AGE, Sept. 10, 1925.

Forging Pins.—National Machinery Co., Tiffin, Ohio. National Forging Machine Talk No. 54 describes forging insulator pins, with illustrations.

Rust Proofing.—Pyrene Mfg. Co., 560 Belmont Avenue, Newark, N. J. A four-page pamphlet describes the Parkerizing and Udyllite rust-proofing processes as carried out by that company at its plant.

Pyrometer Protection Tubes.—Louis C. Eltzen Co., 280 Broadway, New York, and Industrial Welded Products Co., Newark, N. J. Folder describing Pynolog tubes, stated to be the most sensitive pyrometer protection tubes for thermo-couples. The thickness of metal is given as 5/64 in., with an internal diameter of 11/16 in. This thickness is about one-third that shown for a cast tube.

Forced Draft Stokers.—Combustion Engineering Corporation, Broad Street, New York. Sixteen-page catalog of Green stokers for free burning bituminous or lignite coal. This is a chain grate type, with horizontal fuel bed, and is shown in a variety of settings under steam boilers, some of which feature the Dutch oven.

Locating and Jig Boring Machines.—Société Générale d'Instruments de Physique, Geneva, Switzerland. Catalogue No. 440. The company's models 4, 5 and 6 high-precision locating and jig boring machines are described at length, pages being devoted also to the use of the accessories supplied with the machine, the use of a high-speed spindle on the two larger units. Complete specifications in both English and metric units are given. The R. Y. Ferner Co., Investment Bldg., Washington, D. C., represents the company in the United States.

Inland Steel Co. Earnings Large

Net earnings of the Inland Steel Co. in 1925 were the largest in several years, but the balance available for common stock was smaller than in either of the last two years. It was revealed in the annual report issued March 25. The decline is due to a much larger write-off for depreciation and depletion and to an increase in fixed charges. Federal taxes this year were smaller than in 1924. The company's net income for 1925 after all deductions was \$4,869,734, which, after payment of preferred dividends, equaled \$3.52 a share on the common stock. This compared with 1924 net income of \$5,474,600, or \$4.03 a share, and with \$4.01 per share in 1923 and \$1.13 in 1922. The amount transferred to surplus in 1925 was \$1,212,737, against \$1,817,603 in 1924. A detailed financial statement follows:

Income Account		
Year ended Dec. 31	1925	1924
Net earnings from operations, after deducting administration expenses and all charges for repairs and maintenance	\$7,789,587	\$7,748,590
Other income	208,871	295,973
Total profit for year	\$7,998,458	\$8,044,563
Depreciation and depletion	\$1,974,938	\$1,507,296
Provision for exhaustion of minerals	84,952	58,667
Interest on bonds	143,833	716,000
Estimated Federal taxes	669,000	288,000
Payment of employees' fund	258,000	
Net profit for year	\$4,869,734	\$5,474,600
Preferred dividend	700,000	700,000
Balance for common stock	\$4,169,734	\$4,774,600
Common dividends	2,956,997	2,956,998
Surplus for year	\$1,212,737	\$1,817,603
Balance Sheet: Assets		
Dec. 31	1925	1924
Land, plants, mining properties, etc., after reserves	\$49,140,520	\$44,583,924
Investment and advance in affiliated companies	3,152,737	1,177,737
Bills receivable	297,303	237,140
U. S. Government securities	5,501,563	4,000,000
Other investments		49,600
Cash	6,542,299	3,549,054
Inventories	11,859,037	10,690,937
Accounts receivable	6,737,796	5,452,139
Unexpired insurance and deferred charges	1,267,671	512,531
Total assets	\$84,498,926	\$70,253,062
Liabilities		
Common stock*	\$35,000,000	\$35,000,000
Preferred stock	10,000,000	10,000,000
Bonded debt	12,675,000	568,000
Accounts payable	2,459,887	1,734,282
Accrued payrolls	753,103	725,957
Accrued interest and taxes	1,249,839	1,202,311
Preferred dividend payable	175,000	175,000
Operating and contingency reserves	2,355,864	2,230,017
Surplus	19,830,233	18,617,496
Total liabilities	\$84,498,926	\$70,253,062
Net working capital	\$26,300,169	\$20,091,721

*1,182,799 shares of no par.

Annual Report of the General Electric Co.

While orders received by the General Electric Co. in 1925, at \$302,513,380, were 7 per cent greater than the 1924 total of \$283,107,697, the amount of sales billed showed a falling off of 3 per cent. The net sales billed in 1925 amounted to \$290,290,166, compared with \$299,251,869 in 1924. Unfilled orders at the end of the year showed a decided rise, having been \$77,860,000, compared with \$68,958,000 at the close of 1924. Manufacturing profit, after providing for depreciation and taxes, amounted to \$32,810,675, against \$34,342,331 in the previous year. More than \$10,000,000 of income from other sources was added in each year to produce the net income. After interest and discount the profit available for dividends remained at \$38,641,217 in 1925, against \$39,235,548 in 1924. After paying 6 per cent dividends on special stock and 8 per cent dividends on common stock, the year's surplus was \$22,498,097, compared with \$23,635,163 in 1924. Total surplus at the end of the year stood at \$85,848,171.

The balance sheet shows total of assets and liabilities at \$397,247,678, of which current assets, amounting to \$270,271,885, accounted for more than two-thirds. This arises largely from the fact that the manufacturing plants have been almost wholly written off. Total expenditures on manufacturing plants up to the end of 1925 amounted to \$245,308,867. Of this sum only \$55,168,838 is charged against these plants in the balance sheet. Plant reserve and depre-

ciation had accounted for \$129,675,338, while plant dismantled, sold or otherwise disposed of had been deducted to the amount of \$60,464,691.

Annual report for 1925 of the Independent Pneumatic Tool Co., 600 West Jackson Boulevard, Chicago, shows net earnings of \$818,389, or \$4.54 a share on the capital stock, as compared with \$720,255, or \$4.01, in the previous year. This increase in net earnings was accomplished in face of the fact that gross profits fell off from \$2,402,638 in 1924 to \$1,566,011 in 1925. Comparison of the income account for the years ended Dec. 31 follows:

	1925	1924
Gross profits	\$1,566,011	\$2,402,638
Sales, administrative and general expenses	622,708	994,188
Net profit	\$943,303	\$1,408,451
Total income after adjustments	\$935,509	\$1,412,841
Federal taxes	117,120	89,613
Other deductions		608,973
Net earnings	\$818,389	\$720,255

Colorado Fuel & Iron Co. showed a marked gain in 1925 in its net income over the three preceding years. Although gross income showed a recession of \$4,760,000 compared with 1924, the 1925 net of \$1,752,427 after interest, depreciation and federal taxes was equal to \$4.65 a share on the \$34,253,500 common stock outstanding, which compares with a return equal to \$1.05 in the year preceding. The balance sheet as of Dec. 31 last shows assets of \$81,503,312, compared with \$79,682,505 in 1924. There was a slight increase in property valuation, to \$54,283,720, and a small decrease in inventory. Other items in the balance sheet differed but slightly from 1924. Income account with comparison follows:

	1925	1924
Gross	\$34,537,134	\$39,297,320
Operating expenses	29,166,541	35,145,969
Net earnings	\$5,370,593	\$4,151,351
Other income	498,943	477,152
Total income	\$5,869,536	\$4,628,503
Federal taxes	135,000	
Interest, depreciation, etc.	3,982,109	4,108,218
Net income	\$1,752,427	\$520,285
Preferred dividends	160,000	160,000
Surplus	\$1,592,427	\$360,285

Sales volume of the Advance-Rumely Co., La Porte, Ind., in 1925 was 51 per cent ahead of 1924, and net income \$540,577, equivalent to 4.32 per cent on the preferred stock, compared with \$435,737 or 3.49 per cent in the previous year. A comparison of the financial statements for two years follows:

Year ended Dec. 31	1925	1924
Gross operating profits	\$2,824,040	\$1,738,187
Selling, general and administration expenses	2,186,187	1,842,881
Other income	771,684	1,119,302
Federal taxes	92,071	
Debt and other interest	279,926	237,074
Depreciation	496,963	341,798
Net income	\$540,577	\$435,737
Preferred dividends	374,253	374,253
Previous surplus	872,720	811,236
Final surplus Dec. 31	1,039,044	872,720

The Western Electric Co., Inc., Chicago, which during 1925 made several important changes in its capital structure, reports for that year net income of \$14,283,302, after interest and all appropriations, equivalent after preferred dividends to \$17.40 on the 750,000 shares of common stock of no par value outstanding. This compares with net income in 1924 of \$12,126,930, equivalent after preferred dividends to \$20.80 a share on 500,000 common shares outstanding. The report shows total sales amounting to \$297,729,420, compared with \$298,281,138 the previous year. After payment of dividends of \$10 per share, the balance for surplus totaled \$7,424,322, against \$5,399,358.

Annual report for 1925 of the Columbia Steel Corporation, San Francisco, shows gross sales profit of \$2,081,433 and gross income of \$1,471,638. After charges the net income was \$777,943. Preferred dividends left \$117,712, which, added to previous surplus, made total surplus \$1,043,127. Assets and liabilities were \$27,112,355. Current assets stood at \$4,848,297 and current liabilities at \$2,533,676. The report states that the new 26-in. billet mill at the Pittsburg, Cal., plant will be first operated about April 1.

Thomas J. Spellacy has qualified as receiver for the Hayes-Meserole Mfg. Co., Inc., Milford, Conn., wire and metal products.

Machinery Markets and News of the Works

TOOL SALES ARE FAIR

First Quarter of Year Satisfactory, Though Below Final Quarter of 1925

Chicago & North Western Railroad Inquires for 30 Items of Shop Equipment—Railroads Generally Slow in Buying

DESPITE some disappointment in the machine tool trade as to the volume of buying in March, a recapitulation of sales for the first quarter by some of the leading tool manufacturers reveals a fairly satisfactory business in that period, although somewhat less than the volume done in the last quarter of 1925.

March tool sales attained fairly good proportions, the disappointing feature being that many prospective purchases, particularly by the railroads, were held up.

Some of the leading railroads have sent out inquiries for a large number of tools, but in comparison with their acknowledged needs, their purchases have been small. The Chicago & North Western has issued a list of about 30 items. A list issued some weeks ago by the Florida East Coast is reported to have been bought.

Automobile manufacturers supplied a fairly large percentage of the total business done during first quarter by some of the machine tool companies. There has been a steady demand from the leading automobile companies for tools that would lessen production costs and to replace obsolete machines.

New York

NEW YORK, March 30.

REPORTS of a slowing down in machine tool business are quite generally heard, yet sales the past week have been in fair volume. Demand for used tools is better than it has been. Among the sales of the week are the following: A 36-in. x 38-ft. engine lathe to the Hudson Coal Co., Scranton, Pa.; two 6-ft. radial drills to the General Electric Co., Schenectady, N. Y.; a 6-in. x 80-in. thread milling machine to the Ingersoll-Rand Co., Phillipsburg, N. J.; 20-in. geared-head lathe to the M. W. Kellogg Co., Jersey City, N. J.; a universal bench milling machine and a vertical drilling machine to the Pitney-Bowes Postage Meter Co., Stamford, Conn. The Otis Elevator Co. has been a fairly large buyer of tools for its plant at Yonkers, N. Y.

The Yellow Taxi Corporation, 155 East Forty-fourth Street, New York, has engaged Hyde & Shepard, 588 Lexington Avenue, architects, to prepare plans for its proposed service, repair and garage building at East Twenty-third Street and Exterior Avenue to be six stories, 320 x 435 ft., to cost \$500,000 with equipment.

The New York Telephone Co., 15 Dey Street, New York, plans the construction of a power plant at White Plains, N. Y., in connection with an extension and improvement program in this district.

W. C. Bower, room 344, 466 Lexington Avenue, New York, agent for the Detroit River Tunnel Co., Detroit, is asking bids until April 5, for electric locomotives, serial contract No. 6-1926.

The Empire Gas & Fuel Co., 60 Wall Street, New York, an interest of Henry L. Doherty & Co., same address, operating oil properties and refineries, is disposing of a bond issue of \$20,000,000, a portion of the fund to be used for extensions and improvements. Henry L. Doherty is president.

The New York Edison Co., 130 East Fifteenth Street, New York, has completed plans for a one-story power substation at 22 East Thirty-third Street, to cost about \$50,000 with equipment. William Whitehill, 709 Sixth Avenue, is architect.

John De Hart, 1041 Fox Street, New York, architect, will erect a two-story automobile service, repair and garage building, 91 x 100 ft., on Cromwell Avenue, to cost \$70,000 with equipment.

Fire, March 21, caused by the failure of an engine fly-wheel, damaged a portion of the pumping plant of the Nassau Gas Light Co., Kent Avenue and Rush Street, Brooklyn, with loss estimated at \$75,000 including equipment. The company is operated by the Brooklyn Union Gas Co., 176 Remsen Street.

The American Gas & Electric Co., 30 Church Street, New York, operating electric light and power properties in different parts of the country, is disposing of a bond issue of \$7,500,000, a portion of the proceeds to be used for extensions and improvements in plants and system.

The Manhattan Electrical Supply Co., 17 Park Place, New York, with plant at Jersey City, N. J., is arranging for the sale of its storage battery manufacturing branch, and will develop plant facilities, heretofore used for this line, for the production of other electrical products. Charles T. Baisley is president.

The International Motor Truck Co., 25 Broadway, New York, manufacturer of Mack motor trucks, has asked bids on a general contract for a one-story service, repair and garage building, 180 x 270 ft., on Kensico Avenue, White Plains, N. Y., to cost \$180,000 with equipment. Falle & Seelye, 101 Park Avenue, New York, are architects.

The Globe Motor Machinery Co., New York, has leased the five-story building at 214 Centre Street, extending through to 146 Baxter Street, for a new plant. The company will take immediate possession.

The City Commission, Asbury Park, N. J., plans the installation of pumping equipment, air compressor and auxiliary machinery in connection with proposed extensions in the municipal waterworks.

The Whitall-Tatum Co., Millville, N. J., manufacturer of bottles and other hollow glassware, plans to rebuild the portion of its plant destroyed by fire March 21, with loss estimated at close to \$200,000, including glass-blowing machinery and other equipment.

Plans are under way for the construction of a power plant at the textile mill of the United Piece Dye Works, Inc., Hawthorne, N. J., to cost in excess of \$100,000.

The Charles H. Engler Lumber Co., 17 Pollack Avenue, Jersey City, N. J., has awarded a general contract to the Turner Construction Co., 244 Madison Avenue, New York, for a two-story lumber mill and wood-working plant, 90 x 110 ft., to cost about \$60,000 with machinery.

Harry G. Bach, 63 Schureman Street, New Brunswick, N. J., architect, has completed plans for a two-story automobile service, repair and garage building at Jones and Church Streets, to cost about \$80,000 with equipment.

The Jersey Central Power & Light Co., Morristown, N. J., has plans nearing completion for its proposed new steam-operated electric generating plant at Whippany, N. J., with initial capacity of 20,000 kw. The project will include a machine shop, equipment storage building and auxiliary structures, with estimated cost reported at \$1,500,000. The company is operated by A. E. Fitkin & Co., 165 Broadway, New York.

The Board of Aldermen, Morristown, N. J., has authorized the installation of pumping equipment in the Morris Plains section for increased water service.

The Board of Education, South Orange, N. J., has authorized the installation of a manual training department in the proposed new central senior high school on Parker

The Crane Market

WHILE the market continues to be stimulated by a fair number of inquiries for both electric overhead and locomotive cranes, purchasing is slow to develop. In the Chicago district there is an inquiry from the Covel Mfg. Co., Benton Harbor, Mich., for a used 10-ton, about 38-ft. span electric overhead traveling crane, and the International Harvester Co., Chicago, is inquiring for a used 10-ton, 60-ft. span electric overhead crane. There is an inquiry in the market from the port of Rio Grande do Sul, Brazil, for ten 3-ton electric overhead cranes and two 6-ton electric overhead cranes and seven small electric locomotives, bids opening April 15. Among the conditions are that a representative of the bidder shall be present at the opening.

Among recent purchases are:

Delaware, Lackawanna & Western Railroad, New York, a 25-ton locomotive crane from the Industrial Works.

Southern Railway, Washington, two locomotive pile drivers and two 25-ton locomotive cranes from the Industrial Works.

John W. Cowper Co., Buffalo, N. Y., contractor, a 25-ton, 8-wheel, standard gage locomotive crane from the American Hoist & Derrick Co.

Clark Brothers, Ilion, N. Y., a 12-ton, 4-wheel, used Brownhoist locomotive crane from Philip T. King, New York.

General Electric Co. Schenectady, N. Y., a 15-ton overhead crane for Pittsfield, Mass., from the Niles Crane Corporation.

Phoenix Utility Co., 71 Broadway, New York, a 10-ton single I-beam hand-power crane from the Chisholm-Moore Mfg. Co.

McClintic-Marshall Co., Pittsburgh, nine standard and 11 special cranes for Chicago plants, purchased from the Harnischfeger Corporation and the Shaw Electric Crane Co.

E. L. Phillips & Co., 50 Church Street, New York, engineers, a 75-ton, 45-ft. span, 3-motor, overhead crane for the Long Island Lighting Co., from the Cleveland Crane & Engineering Co.

Avenue, Maplewood, to cost \$1,800,000, to include a metal-working division, machine shop, wood-working department and other divisions. Guilbert & Betelle, Chamber of Commerce Building, Newark, are architects.

The Ingersoll-Rand Co., Phillipsburg, N. J., manufacturer of mining machinery, etc., has awarded a general contract to the R. T. & C. D. Stewart Contracting Co., Centre Square, Easton, Pa., for a three-story addition, 60 x 175 ft., to cost approximately \$50,000. Headquarters are at 11 Broadway, New York.

The Lock Joint Pipe Co., Arlington Avenue, Ampere, N. J., manufacturer of patented concrete pipe, has leased property at South Nashville Avenue and Sixty-sixth Street, Chicago, totaling about 280,000 sq. ft. of ground area, as a site for a new branch plant.

The Borough Council, Beach Haven, N. J., will build a pumping plant in connection with extensions and improvements in the municipal waterworks.

The Board of Education, Cliffside Park, N. J., plans the installation of a manual training department in a proposed two-story high school addition at Riverview and Palisades Avenues to cost \$325,000, for which bids have been asked on a general contract. Ernest Sibley, Bluff Road, Palisades, is architect.

The American Locomotive Co., 30 Church Street, New York, has announced intentions of discontinuing operations at its Paterson, N. J., plant, effective May 1. Work on hand at that time will be transferred to other plants of the company, including the works at Schenectady, N. Y.

H. Kohnstamm & Co., 87 Park Place, New York, will build a power house at its proposed chemical plant at Harrison and Bergen Avenues, Kearny, N. J. A one-story automobile service, repair and garage building for company motor trucks and cars will also be built. H. D. Scudder, Jr., and W. A. Bishop, Union Building, Newark, N. J., are architects and engineers.

The New York Wire & Spring Co., Fifteenth Street, Hoboken, N. J., manufacturer of automobile bumpers, valve and clutch springs, etc., has acquired the plant of the United Last Co., at 136-50 Tichenor Street, Newark, N. J., consisting of a main three-story building, 175 x 210 ft., and several one-story structures. The new owner will establish a plant at this location and contemplates the early installation of machinery. It is said that the present Hoboken works will be removed to the new site.

The Boissier Electric Co., formerly of Long Island City, N. Y., is being reorganized by A. A. Mery in conjunction with officials of the Hanson & Van Winkle Co. of New Jersey. The Boissier Electric Co. has been incorporated as the Boissier Electric Corporation and has contracted with the Hanson & Van Winkle Co. to manufacture its products, including generators, motor generator sets, panel switchboards, rheostats, copper conducting rod systems, steel tanks, wood tanks lined and unlined anodes, electro-depositing plants for rotogravure cylinders, electrotyping and electroplating equipment, together with a full line of polishing equipment and supplies. A. A. Mery is secretary and general manager of the Boissier Electric Corporation.

The Gifford Heat Control Systems, Inc., 1 Broadway, New York, has recently been incorporated to manufacture heat control units. It is the intention ultimately to have a plant in New York, but no definite plans along that line have been formulated. At present the company is having its product made on contract. James S. Gifford is president.

The Triplex Machine Co., 50 Church Street, New York,

has received orders for nibbling machines from the Picatinny Arsenal, Dover, N. J.; the Railroad Accessories Corporation, Albany, N. Y.; Rapid Addressing Machine Co., New York, and the Mehl Machine & Tool Co., Roselle, N. J. A bench lathe has been sold to the Steward Davit & Equipment Corporation, Hudson, N. Y.

The Westchester Automatic Heat, Inc., 13 Huguenot Street, New Rochelle, N. Y., has been incorporated to manufacture oil burning equipment. It is in the market for pumps, tanks, and electrical equipment.

Philadelphia

PHILADELPHIA, March 29.

PLANS are being completed for a five-story addition for the Steel Heddle Mfg. Co., Twenty-first Street and Allegheny Avenue, Philadelphia, manufacturer of textile machinery and parts, to cost close to \$125,000 with equipment. Clarence E. Wunder, 1529 Locust Street, is architect.

Samuel Driban, 1301-5 South Second Street, Philadelphia, manufacturer of wagons and parts, has awarded a contract to J. Rothman, 5438 Webster Street, for a two-story addition on which work will start in April.

The Philadelphia Storage Battery Co., Ontario and C Streets, Philadelphia, manufacturer of electric batteries, has asked bids on a general contract for an addition to cost about \$75,000.

The Board of Education, Keystone Building, Nineteenth Street, Philadelphia, is asking bids until April 6, for steel lockers and other equipment for local schools. William Dick is secretary and business manager.

The Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, has completed plans for a two-story and basement automatic power substation, 60 x 100 ft., to cost about \$70,000 with equipment. John T. Windrim, Commonwealth Building, is architect.

John Molitor, architect for the Sesqui-Centennial International Exposition, city of Philadelphia, has prepared plans for a one-story power substation on Oregon Avenue near Broad Street, for service at the exposition buildings.

L. J. Tonk, Schaff Building, Philadelphia, architect, has plans for a four-story automobile service, repair and garage building at 60 North Fourth Street, 55 x 110 ft., to cost \$100,000 with equipment.

The Board of Directors, West Jersey Homeopathic Hospital, Mount Ephraim and Atlantic Avenues, Camden, N. J., has revised plans for a one-story steam power plant, including boiler and engine rooms; one-story pumping plant; and one-story mechanical laundry building, to cost \$100,000 with equipment. F. F. Kauffman, 12 North Thirteenth Street, Philadelphia, is engineer.

A manual training department will be installed in the proposed two-story school to be erected by the Hamilton Township Board of Education, Hamilton Township, near Trenton, N. J., to cost \$175,000. It is proposed to ask bids soon. William A. Klemann, First National Bank Building, Trenton, is architect.

The Golding Sons' Co., Peace Street, Trenton, N. J., operating flint and feldspar properties, has authorized plans for the construction of a new feldspar grinding mill for an initial output of 100 tons per day. It is understood that the present mill of the company on Factory Street will be removed to the new location. Herbert P. Margerum is president, and M. A. Murray, secretary and treasurer.

The Essex Rubber Co., Beakes and May Streets, Trenton, N. J., manufacturer of rubber tubing, mechanical rubber specialties, etc., has filed plans for a one-story addition, 65 x 240 ft., to cost about \$65,000, for which a general contract has been let to the Henry R. Fell Co., 338 Southard Street. C. H. Oakley is president.

MacKenzie & Wiley, Bankers' Trust Building, Philadelphia, architects, will begin the construction of a two-story automobile service, repair and garage building, 196 x 215 ft., with capacity for 400 cars, at Brief and Fairfield Avenues, Upper Darby, Pa., to cost about \$90,000 with equipment.

Fire, March 17, destroyed a portion of the bicycle parts and toy manufacturing plant of the Keyser Fry Co., 618 North Eighth Street, Reading, Pa., with loss reported at \$45,000 including equipment. Plans for rebuilding are under advisement. The same fire also damaged a portion of the plant of the Reading Lime Co., adjoining.

The Fisher Body Corporation, General Motors Building, Detroit, has work under way on additions to its plant at Fleetwood, Pa., formerly the works of the Fleetwood Body Corporation. Considerable additional equipment will be installed for custom automobile body production.

The Atlantic Ice Co., Coatesville, Pa., has acquired the plants of the Arctic Ice Co. and the Phoenix Ice Co., Phoenixville, Pa., for \$125,000. The new owner is considering plans for extensions and betterments, including additional equipment installation.

Motors and other power equipment, conveying apparatus, etc., will be installed in the proposed printing plant to be constructed by the Mack Printing Co., Easton, Pa., 130 x 300 ft., estimated to cost \$175,000. Harvey Mack heads the company.

Fire, March 23, destroyed a portion of the plant of the Burdett Oxygen Co., Swede and Washington Streets, Norristown, Pa., manufacturer of industrial oxygen and kindred products, with loss estimated at \$45,000 including equipment. It is proposed to rebuild.

The Pennsylvania Railroad Co., Broad Street Station, Philadelphia, is considering an appropriation of about \$250,000 for the construction of a new engine house, with shop facilities, freight terminal building, and other structures at Lock Haven, Pa. H. M. Carson, Williamsport, Pa., general superintendent, will be in charge.

The Water Department, Allentown, Pa., plans the installation of pumping machinery in connection with proposed extensions and improvements in the municipal waterworks, estimated to cost \$500,000. Morris Knowles, Inc., Westinghouse Building, Pittsburgh, is consulting engineer.

Charles H. Fetterolf, Mount Union, Pa., will rebuild his planing mill and lumber plant, destroyed by fire a number of months ago, with loss of about \$75,000, including machinery. New equipment will be installed.

Buffalo

BUFFALO, March 29.

THE Elmira Water, Light & Railroad Co., Elmira, N. Y., has plans under way for a steam-operated electric power house on East Water Street, to cost close to \$1,000,000 including equipment. The company is operated by the United Gas & Electric Co., 111 Broadway, New York, which will be in charge of the project.

The Board of Education, Schoharie, N. Y., plans the installation of a manual training department in its proposed two-story high and grade school to cost \$125,000, for which it is expected to ask bids on a general contract early in May. Thomas L. Gleason, 45 Maiden Lane, Albany, is architect.

The Republic Metalware Co., 90 Alabama Street, Buffalo, is said to have arranged an appropriation of about \$400,000 for proposed extensions and improvements in its plant, including the installation of additional equipment. Work will soon begin. Hudson & Hudson, Dun Building, are architects.

The Ballston Insulating & Composition Co., Ballston Spa, N. Y., manufacturer of radio equipment, has preliminary plans under advisement for rebuilding the portion of its plant destroyed by fire March 20, with loss reported at \$70,000 including equipment.

Julius B. Schultz, 1370 Main Street, Buffalo, architect and engineer, has plans for a steam-operated electric power house to cost about \$75,000, owner's name temporarily withheld. Bids will be asked early in April.

Fire, March 22, destroyed a portion of the automobile service, repair and garage building of the Department of Public Works, Rochester, N. Y., with loss estimated at \$200,000, of which about one-half is represented by motor trucks and automobiles. It is planned to rebuild.

The American Radiator Co., 22 Roseville Street, Buffalo, has awarded a general contract to J. W. Cowper, Inc.,

Fidelity Building, for the construction of a one-story addition, 80 x 202 ft., to cost \$65,000, at its Standard plant. The work will be carried out in connection with an expansion program at this works and awards for other structures will be made later.

The J. J. Reynolds Iron Works, Binghamton, N. Y., is inquiring for a power brake, 6 ft. long, open end preferred, capacity ¼-in. stock, belt or power drive.

Chicago

CHICAGO, March 29.

FOLLOWING several quiet weeks the past seven days have been unusually active from the standpoint of machine tool buying and fresh inquiry. Demand is widespread and is reflected in a large number of individual purchases. In total amount of business closed March will compare favorably with February, although it will probably fall short of the same month in 1924. Farm implement makers continue to buy from time to time, and the Florida East Coast list is reported to have been purchased, largely through Eastern dealers. The Chicago, Rock Island & Pacific bought a car-wheel lathe and a 53-in. vertical boring mill. The Pullman Car & Mfg. Corporation, Pullman, Ill., bought a 12-ft. plate bending roll and a 5-ft. straightening roll. The Whiting Corporation, Harvey, Ill., bought a 62-in. vertical boring mill and a 10-ft.-16-ft. extension boring and turning mill. The Modern Engineering Co., St. Louis, bought an automatic milling machine.

The Chicago & North Western and subsidiary lines have issued a list for shops at Milwaukee; St. Paul; Winona, Minn.; Escanaba, Mich.; Kaukauna, Wis.; Clinton, Iowa; Boone, Iowa; Hudson, Wis.; Omaha, Neb., and Sioux City, Iowa. The tools, which are listed below, are all to be driven by alternating-current motors except where otherwise specified.

One Reed-Prentice, or equivalent, high-speed geared-head engine lathe, 14-in. x 5-ft.

Two Racine, or equivalent, three-speed transmission hack saws.

Eight Sheldon, or equivalent, frame jaw grinders, air driven.

One Micro internal grinder.

One 18-in. x 6-ft., 20¼-in. swing, selective-head engine lathe, belt driven.

One universal tool and cutter grinder, similar to Cincinnati No. 1½, belt driven, with motor and starter.

One 24-in. heavy pattern drilling machine, similar to Cincinnati Bickford Tool Co., belt driven.

One 18-in. x 8-ft., 20¼-in. swing selective-head engine lathe, belt driven.

One 36-in. high power upright drilling machine, similar to Cincinnati Bickford Tool Co., belt driven with motor and starter.

One No. 402 Oster portable pipe threading machine.

One 6-in. x 6-in. Peerless, or equivalent, metal saw.

One two-wheel floor grinder, 8-in. x 2-in. x ¾-in. wheels, similar to F. H. A. Cincinnati.

One two-wheel floor grinder, 18-in. x 3-in. wheels.

One 24-in. upright drilling machine, similar to Cincinnati Bickford, belt driven with direct-current motor and starter.

One 3-in. Hurlburt-Rogers, or equivalent, cutting-off machine; direct-current motor.

Five dry grinding machines, 18-in. x 3-in., similar to Cleveland Armature Works No. 506, with direct-current motor and starter.

One 1¼-in. Acme, or equivalent, upsetting and forging machine with direct-current motor and starter.

One Niagara power squaring shear, for 10-gage x 96-in. wide sheets, with direct-current motor and starter.

The Hill Products Co., 4601 Belmont Avenue, Chicago, manufacturer of nuts, will build a one-story factory, 120 x 280 ft., to cost \$100,000. D. J. Schaffner, 64 West Randolph Street, is architect.

Vanderlie & Peterson, 2164 Clybourn Avenue, Chicago, will build a six-story furniture factory, 60 x 180 ft., to cost \$125,000. S. Scott Joy, 2001 West Pershing Road, is architect.

Mortenson & Nelson, will build a one-story brick pattern shop, 50 x 110 ft., at 1461 West Grand Avenue, to cost \$15,000. E. G. McClellan, 7441 Cottage Grove Avenue, is architect.

The Commonwealth Edison Co., 72 West Adams Street, Chicago, will build a nine-story service building, 105 x 140

ft., to cost \$1,300,000. The architects are G. C. Ninnons & Co., 122 South Michigan Avenue.

The Illinois Central Railroad, 109 East Roosevelt Road, Chicago, will build a one-story brick repair shop for electrical equipment, 165 x 339 ft., to cost \$270,000. The architect is C. H. Mottier, 109 East Roosevelt Road.

The Crowe Name Plate & Mfg. Co., Chicago, is planning the erection of a factory building to replace its present structure at the corner of Ravenswood Avenue and Grace Street.

The H. M. Dietrick Co., Chicago, has purchased the Peoria Foundry Co. at 1306 South Washington Street, Peoria, Ill. Officers of the new company are: President, M. H. Dietrick, Chicago; vice-president, Joseph F. Hadank, Peoria; secretary, Lawrence Ryan, Chicago; treasurer, Lewis Hosbain, Chicago.

The Foster Bolt & Nut Co., Cleveland, has taken a 20-year lease for 70,000 sq. ft. of ground space in the Clearing Industrial district, Chicago, which is being improved with two one-story buildings. In addition to this, the company has secured option to purchase 70,000 additional sq. ft. for future expansion.

The Tyra Co., Inc., 1111-1113 Fifth Street, South, Minneapolis, Minn., has been incorporated to manufacture cornices, skylights, steel ceilings, metal roofing, metal covered moldings, etc. It will also engage in metal stamping work on contract. Equipment has been purchased.

The Strombeck Becker Mfg. Co., 235 Fifty-first Street, Moline, Ill., manufacturer of wood handles and other turned wood products, has awarded a general contract to the Axel Carlson Co., Peoples' Bank Building, for a four-story addition, 60 x 82 ft., to cost approximately \$50,000. J. F. Strombeck is president.

The American Gas Machine Co., 233-37 East Clark Street, Albert Lea, Minn., has acquired property on Madison Street, and is considering the construction of a new three-story plant to cost \$60,000. H. C. Hanson is president.

The Board of Trustees, Colorado School for Deaf and Blind, Colorado Springs, Colo., will soon take bids for a power house, 48 x 59 ft., to cost \$55,000. Thomas D. Hetherington, Colorado Springs, is architect.

The Chicago, Milwaukee & St. Paul Railroad Co., 80 East Jackson Boulevard, Chicago, is reported to be planning for the early rebuilding of its engine house and shops at Channing, Mich., recently destroyed by fire, with loss in excess of \$50,000.

The City Council, Dubuque, Iowa, will ask bids in April for proposed extensions in waterworks, including mechanical equipment and electric power system, to cost \$85,000. The Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is engineer.

The Williams Oil-O-Matic Heat Corporation, 207 West Washington Street, Bloomington, Ill., has awarded a general contract to the Austin Co., Chicago, for a new unit at its oil-burning equipment manufacturing plant, to be known as building No. 5. It will be one-story, 150 x 300 ft., to cost approximately \$60,000. C. W. Williams is manager.

Mathias Klein & Sons, 3200 Belmont Avenue, Chicago, manufacturers of electric line equipment and materials, have engaged Mundie & Jensen, 39 South La Salle Street, architects, to prepare plans for their proposed new plant on site lately acquired, to be one-story, 100 x 300 ft. J. M. Klein is president.

The United States Radiator Co., 500 North Dearborn Street, Chicago, has asked bids on a general contract for a one-story addition to its plant at 7 East Twenty-eighth Street, 45 x 126 ft., to cost \$30,000. A. G. Himeiblauf, 30 North Dearborn Street, is architect.

The proposed new mill of the Minnesota & Ontario Paper Co., International Falls, Minn., for which superstructure will soon be started, will be two stories, 120 x 400 ft., to be equipped for the manufacture of wrapping papers, estimated to cost close to \$100,000 with equipment. E. W. Backus is president.

The Board of Education, School District No. 6, Greeley, Colo., plans the installation of manual training equipment in its proposed new high school to cost \$250,000, in which amount bonds are being arranged. It is expected to ask bids soon on a general contract. The William N. Bowman Co., Insurance Building, Denver, Colo., is architect.

The Highland Park Ice Co., 33 South St. John's Avenue, Highland Park, Ill., will begin the erection of a one-story ice-manufacturing plant on the Lake Park Boulevard, 75 x 150 ft., to cost approximately \$100,000 with machinery. C. P. Ringer, 432 Broadway, Milwaukee, is architect.

The Granite Bl-Metallic Co., Philipsburg, Mont., is planning the early rebuilding of the portion of its mill recently destroyed by fire, with loss reported at \$40,000 including equipment. The Philipsburg Mining Co., on adjoining site,

is also planning to rebuild its plant, destroyed in the same fire.

The Stearns-Roger Mfg. Co., 1718 California, Street, Denver, is in the market for an Ingersoll miller, approximately 36 x 30 in., two side heads, one or two vertical heads.

The Siems-Stembel Co., 2600 Como Avenue, St. Paul, Minn., is inquiring for a multiple punch, 12-ft. ram, 300 tons capacity, motor driven; a single end punch, 1 1/4 in. x 1 in., 24-in. or 36-in. throat, motor driven.

Cincinnati

CINCINNATI, March 29.

MACHINE tool sales in March attained fairly good proportions and several local builders report that the volume of orders was larger than expected. With one or two exceptions business of Cincinnati manufacturers in the first quarter of 1926 has been much better than in the corresponding period last year, in some cases the increase being as high as 75 to 100 per cent. Despite the fact that the last three months of 1925 brought out the greatest amount of orders since 1920, at least four important local builders state that their total sales to date this year have exceeded those in October, November and December. This condition, however, is the exception rather than the rule. An increase of approximately 25 per cent in new business over the first quarter last year and a corresponding decrease as compared with the fourth quarter represent the average in the local market.

Automobile makers have been the best source of business this year. There are some local plants in which purchases in the Detroit district have made up 75 per cent of total sales. While this percentage is high, it is safe to say that one-half of the total business locally has originated in the automotive industry. Railroads, on the other hand, have been a disappointing factor. Issuance of sizable lists by several carriers led machine tool builders to believe that there would be considerable buying, but constant postponement of definite action has been the only result. There has been a sprinkling of orders from railroads, but no purchases on an extensive scale. Electrical manufacturers have purchased some equipment, but here again a lack of real interest has been noted. Aside from automobile makers the general industrial field has been the most fertile source of business.

The General Electric Co. has bought considerable equipment locally, including radial drills, lathes and shapers, while the Westinghouse Electric & Mfg. Co. is expected to close for two heavy-duty lathes. An automobile company has taken five large lathes and three grinding machines from a local builder. The Chicago, Rock Island & Pacific Railroad purchased a 53-in. boring mill and the Cincinnati Northern Railroad a 48-in. carwheel borer from the Niles-Bement-Pond Co. The McClintic-Marshall Co., Pittsburgh, which has contracted for a number of punching and shearing machines in the past three weeks, bought a 42-in. and a 60-in. rotary planer. The Pittsburgh & Lake Erie Railroad took a 100-in. extra heavy boring mill.

The Cincinnati Planer Co. sold a 48-in. planer and a 22-in. machine in the New England territory. The General Electric Co., for its Pittsfield, Mass., plant, bought two 6-ft. right line radial drills. This company also contracted for a 4-ft. Morris radial drill for delivery to Lynn, Mass. A local boring mill manufacturer states that considerable business has been booked from an elevator manufacturer and from transmission machinery builders as well as from other companies in the general industrial field. The Pullman Car & Mfg. Co., Pullman, Ill., bought a large Long & Allstatter punching machine, while the Foundry Service Corporation, Freeport, L. I., took a 48-in. slab miller.

There is considerable activity in used machinery. The Banner Machine Co., Columbiana, Ohio, bought a 48-in. x 30-ft. reversing motor-driven planer and the Patch Mfg. Co., Rutland, Vt., purchased a 24-in. Gleason gear planer. The Proutyline Products Co., Hermosa Beach, Cal., contracted for a 30-in. Morris radial drill, while the Hayes-Hunt Co., Elizabeth, N. J., took an 18-in. slotter. Other purchases include a 6-ft. radial drill for the Heppenstal Forge & Knife Co., Pittsburgh, and a 30-in. x 12-ft. planer for the A. B. C. Elevator Co., Jersey City, N. J.

The Witt Cornice Co., 2118 Winchell Avenue, Cincinnati, manufacturer of metal refuse receptacles, has awarded a general contract to the Austin Co. for a new galvanizing plant of the monitor type, 100 x 300 ft. J. W. Witt is president and treasurer.

A power house and refrigerating plant will be constructed at the proposed new plant of E. Kahn's Son Co., 415 Livingston Street, Cincinnati, on Spring Grove Avenue. A rendering building for tallow and grease production will also be built. The entire project will cost \$1,000,000 with equipment. Henschin & McLaren, 1637 Prairie Avenue, Chicago, are engineers.

The Groesbeck-Dickson-Kahn Co., Fourth and Walnut Streets, Cincinnati, has plans for a two-story, L-shaped automobile service, repair and garage building, to cost \$80,000 with equipment.

The Standard Gas & Electric Co., 208 South La Salle Street, Chicago, has authorized a fund of approximately \$7,000,000 for the proposed hydroelectric power project of the Louisville Hydro-Electric Co., Louisville, on the Ohio River, for which work is being placed under way. The Standard company has arranged a total appropriation of \$22,159,000 for extensions and improvements in its various power plants and systems.

The Knoxville Screen & Mfg. Co., 340 Oakhill Avenue, Knoxville, Tenn., has preliminary plans for extensions and improvements to cost \$20,000. D. E. Parsons is head.

The Louisville Taxicab & Transfer Co., Second Avenue and Walnut Streets, Louisville, has tentative plans for a three-story service, repair and garage building, 100 x 200 ft., to cost \$100,000 with equipment. Lee L. Miles is president.

D. M. Harris, Dunlap, Tenn., and associates have organized a new company to construct and operate a local plant for the manufacture of furniture and other wood products. Work will soon begin. The plant will cost approximately \$45,000. Mr. Harris will be president of the new company, which will be capitalized at \$100,000; and H. P. Payne, Dunlap, secretary.

The Charles Schiear Motor Co., 301 West Third Street, Dayton, Ohio, has plans for a two-story and basement service, repair and garage building, 95 x 175 ft., to cost about \$85,000. Joseph G. Steinkamp & Brothers, Mercantile Library Building, are architects. C. C. Conover is manager.

The Jackson Railway & Light Co., Jackson, Tenn., plans the construction of an automatic power substation at Whiteville, Tenn. A pumping plant and water-treating works will also be installed. The project is reported to cost \$30,000.

Rodgers & Co., 900 South Gay Street, Knoxville, Tenn., have plans for a two-story automobile service, repair and garage building, 100 x 150 ft., to cost \$65,000 with equipment.

The Tennessee Electric Power Co., Chattanooga, Tenn., is considering plans for a steam-operated electric power house at Erin, Tenn., with initial capacity of 1500 hp. A transmission line will be constructed to Waverly, Centerville and vicinity.

Indiana

INDIANAPOLIS, March 29.

BIDS will be received by the Board of Trustees, Eastern Indiana Hospital for Insane, Richmond, Ind., until April 12 for one 250 kva. engine and generator unit; transformer and switchboard room, and other work in connection with a power plant at the institution. Snyder & Rotz, Merchants' Bank Building, Indianapolis, are engineers.

The Studebaker Corporation, South Bend, Ind., has awarded a general contract to Ralph Sollitt & Sons, 518 East Sample Street, for a four-story addition, 80 x 195 ft., to cost \$250,000 including equipment. The company will remove its present manufacturing, engineering and purchasing department at Detroit to the South Bend works during the summer, making the latter headquarters for all executive departments. It is purposed to continue the production at plants Nos. 3, 4, 5 and 10 at Detroit. A. R. Erskine is president.

The Hartz Glass Co., Dunkirk, Ind., has awarded a general contract to G. W. Heinzelman & Son, First Street, Marion, Ind., without competition, for a one-story addition, 75 x 460 ft., to cost about \$75,000. P. S. Hartz is president.

The State Line Generating Co., 72 West Adams Street, Chicago, organized by officials of the Commonwealth Edison Co., the Middle West Utilities Co., same address, and affiliated organizations, has obtained property on Lake Michigan at Hammond, Ind., approximating 80 acres, as a site for a new steam-operated electric generating plant. The initial unit will be equipped for a capacity of 200,000 kw., and will be supplemented by four additional units of like size. A steel tower transmission line will be constructed for service in the Chicago-Illinois and Indiana industrial districts. The entire project is reported to cost \$25,000,000. Samuel Insull is head.

The Superior Body Works, 717 West Nelson Avenue, Marion, Ind., manufacturer of automobile bodies, is said

to have preliminary plans for a one-story addition. Work will probably begin in the fall. Allen Messick is manager.

The G. I. Sellers & Sons Co., Elwood, Ind., manufacturer of kitchen cabinets and kindred products, is completing plans for a two-story addition, 75 x 170 ft., and one-story power house, 45 x 70 ft. A new four-story office and operating building, 50 x 50 ft., will also be erected. The entire project will cost \$100,000. W. A. Risinger, 515 South Anderson Street, is architect; Snider & Rotz, Merchants' Bank Building, Indianapolis, are engineers.

The Anderson Stove Works, North Anderson, Ind., will soon ask bids on a general contract for a one-story addition to cost about \$35,000. E. F. Miller, Farmers' Trust Building, is architect. J. C. Quinn is general manager.

The Board of Education, Fowler, Ind., plans the installation of manual training equipment in its proposed two-story and basement high school estimated to cost \$175,000, on which bids have been asked on general contract. John Bruck, Kentland, Ind., is architect.

The Aladdin Mfg. Co., Muncie, Ind., manufacturer of electric lamps, etc., will soon take bids for a one-story addition, 80 x 92 ft., to cost about \$40,000 with equipment.

New England

BOSTON, March 29.

THE closing days of March witnessed a second dull period for the month in local machine tool business. Sales the past week were mostly new tools, but few in number, and new inquiries have dropped to the lowest point in several months. Numerous old prospects, apparently on the point of closing, have been postponed, temporarily at least. Machine shops generally are busy throughout New England, but doing less than on March 1. Many companies associated with basic industries are back on early January schedules. The falling off in new machine tool prospects is therefore attributed to the slowing up of industrial New England.

In contrast with machine tools, the market for small tools continues active, yet it is noted that some of the largest machine shops are ordering fewer tools.

Bids closed March 29 on a proposed three-story, 80 x 230 ft. addition for the Foster Machine Co., South Broad Street, Westfield, Mass. M. B. Harding, 6 Main Street, Westfield, is the architect.

The D. R. Campbell Machine Co. 52 Purchase Street, Boston, has awarded contract for the erection of a machine shop on Mildred Avenue, Dorchester, Boston. Brainerd & Leeds, 99 Chauncy Street, Boston, are the architects.

The University of Maine, Orono, Me., F. H. Strickland, president, will close bids April 14 on a proposed mechanical engineering building, for which miscellaneous equipment will be required. Blodgett & Law, 20 Newbury Street, Boston, are the architects.

Wellington & Buck, Bridge Street, East Cambridge, Mass., coal, have purchased approximately 50,000 ft. on Somerville Avenue near their present location on which a coal handling plant will be erected shortly. Conveying machinery will be required.

Construction will soon begin by the E. Ingraham Co., Bristol, Conn., on a five-story, 80 x 125 ft. warehouse, the two upper floors of which will be used for manufacturing; a one-story addition to the buffing and plating departments, increasing the capacity 65 per cent, and other improvements.

The Foxboro Co., Neponset Avenue, Foxboro, Mass., manufacturer of measuring instruments and precision equipment, will soon begin work on an addition to cost more than \$65,000. Lockwood, Greene & Co., 24 Federal Street, Boston, are architects and engineers. E. H. Bristol is president.

The Cameron Avenue Garage, Inc., 40 Cottage Street, Chelsea, Mass., has engaged E. S. Moffie, 51 Cornhill Street, Boston, architect, to prepare plans for a one-story service, repair and garage building, 200 x 230 ft., to cost about \$100,000 with equipment.

The Standard Oil Co., New Haven, Conn., has taken out a permit for extensions and improvements in its storage and distributing plant on Forbes Avenue, to cost about \$50,000.

The Brown Co., Portland, Me., operating pulp and paper mills and hydroelectric power properties with main mill at Berlin, N. H., is disposing of a bond issue of \$20,000,000, a portion of the proceeds to be used for proposed expansion and betterments. H. J. Brown is president.

The City Gas Department, Holyoke, Mass., has plans under way for a steam power house at its gas works, estimated to cost \$45,000 with equipment. McClintock & Craig, Bridge Street, Springfield, Mass., are architects and engineers.

The Blackstone Valley Gas & Electric Co., Pawtucket, R. I., is arranging a new bond issue of \$4,000,000, a considerable portion of the proceeds to be used for extensions and improvements in power plants and system. It is proposed to expend about \$1,000,000 for work in the Pawtucket district, and \$500,000 at Woonsocket, R. I., and vicinity.

The Tidewater Paperboard Co., Norwich, Conn., recently organized with a capital of \$100,000, is said to be arranging to take over the former plant of the Uncas Paperboard Co., Thamesville, recently acquired at a receiver's sale by Canadian interests. It is proposed to make improvements, commencing operations at an early date. The new organization is headed by Donald Macleod, Montreal, Frank L. McGuire and C. H. Hull, both of 240 State Street, New London, Conn.

The City Council, Quincy, Mass., has authorized the purchase of two steel tanks on towers, one with capacity of 1,000,000 gal., and the other of 400,000 gal., in connection with extensions and improvements in the waterworks. A fund of \$600,000 has been arranged for the entire project. Metcalf & Eddy, 14 Beacon Street, Boston, are consulting engineers.

The Motor Mart Garage Corporation, Boston, Mass., recently organized by J. Dallas Corbiere and associates is disposing of a bond issue of \$1,500,000, the larger part of which will be used for the construction of an eight-story and basement service garage and repair building, with capacity of 1600 cars, on block bounded by Stuart and Church Streets, Columbus Avenue and Broadway. It is expected to have the building completed early in 1927. Ralph Harrington Doane, 162 Newbury Street, is architect.

The City Hall Hardware Co., 150 Washington Street, Providence, R. I., will erect a four-story plant at Snow and Washington Streets to cost \$200,000 with equipment.

Pittsburgh

PITTSBURGH, March 29.

MACHINE tool business for the month of March has been in fairly good volume in this district, and some houses report sales to have been more numerous and to have reached a higher money value than in either February or January. Most of the orders placed have been for single tools, but the American Sheet & Tin Plate Co., bought six machines for its Shenango works, New Castle, and 15 punches and shears were bought by the McClintic-Marshall Co., for its Chicago district plants. The Erie Foundry Co., Erie, Pa., will soon start work on another extension to its main machine shop. Considerable mill auxiliary equipment is pending for the Homestead works of the Carnegie Steel Co. The Graham Bolt & Nut Co., Pittsburgh, has bought a 36-in. centering machine.

Contract has been let by the Standard Steel Specialty Co., First Avenue and Eleventh Street, Beaver Falls, Pa., to the Inland Construction Co., Pittsburgh, for a one-story addition, 120 x 160 ft., to cost about \$50,000. E. J. Wagner is president and treasurer.

Bids will be received by the United States Engineer, Pittsburgh, until April 12, for one submerged vertical shaft centrifugal pump.

The West Penn Power Co., West Penn Building, Pittsburgh, has authorized plans for a new automatic substation near the Kittanning Road, Butler, Pa. The work will include the construction of a steel tower transmission line from the power plant at Springdale, Pa., and is estimated to cost \$1,000,000.

The Brockway Clay Co., Brockway, Pa., recently organized, has acquired about 700 acres of clay and coal lands near the borough limits and will use a portion of the site for the immediate construction of a proposed plant for the manufacture of vitrified sewer pipe, drain tile, etc. Equipment and facilities will be provided for employment of about 90 men.

The City Council, Grove City, Pa., is considering plans for extensions in the municipal electric light and power house, to include the installation of a new generating unit and accessory equipment.

The Pittsburgh Plate Glass Co., Frick Building, Pittsburgh, has work in progress on an addition to its plant at

Creighton, Pa., to double the present capacity. It will cost close to \$500,000 with machinery.

The Lewisburg School District, Lewisburg, Pa., is considering the installation of manual training equipment in its proposed two-story and basement high school, estimated to cost \$175,000. W. G. Eckles & Co., Lawrence Savings & Trust Building, Newcastle, Pa., are architects.

The Craven Demetter Motor Co., Monongahela, Pa., has completed plans for a two-story service, repair and garage building, to cost about \$50,000 with equipment. A. T. Craven is head.

The Modern Window Glass Co., Salem, W. Va., has been acquired by new interests. Plans are under consideration for extensions and betterments. Employment will be given to about 250.

The Pickett Lumber Co., Warren, Pa., has awarded a general contract to the Truscon Steel Co., Youngstown, for the erection of a two-story steel lumber and builders' supply warehouse, 60 x 160 ft., on a site recently acquired. It will be equipped with electrically operated conveying, hoisting and handling machinery.

South Atlantic States

BALTIMORE, March 29.

A GENERAL building contract has been let by the Chesapeake & Potomac Telephone Co., 723 Thirteenth Street, N. W., Washington, to the Charles Tompkins Co., 1614 Park Road, N. W., for a four-story equipment storage and distributing plant, 200 x 200 ft., at North Capital and Pierce Streets, to cost \$500,000, with material-handling, conveying and other equipment. The work will include an automobile service, repair and garage building for company trucks and cars. MacKenzie, Voorhees & Gmelin, 1325 H. Street, N. W., are architects.

Samuel T. Williams, 8 East Lexington Street, Baltimore, engineer, has inquiries out for a tower-type crane with 50-ft. boom, about 15 tons capacity, steam or electrically operated.

The General Baking Co., 342 Madison Avenue, New York, is said to have arranged an appropriation of \$1,000,000 for its plant at Baltimore, work on which has been started. The installation will include ovens and power equipment, conveying machinery and other mechanical apparatus. Fred H. Frazier is chairman of the board.

The Norfolk & Western Railway Co., Clyde Cocke, purchasing agent, N. & W. Railway Building, Roanoke, Va., is taking bids until April 7 for 1660 wrought steel wheels, contract serial No. AA-405; also 101 cast steel truck bolsters, contract serial No. AA-406.

K. L. Byrne, Van Bibber Lane, near Frederick Road, Baltimore, manufacturer of screens, wire cloth specialties, etc., is considering a one-story addition to his plant on Poplar Grove Street, to cost about \$25,000.

The Ware County Light & Power Co., Waycross, Ga., plans the early installation of additional equipment at its plant, including a 3300-hp. steam turbine, 500-hp. steam boiler, coal and ash-handling equipment, cooling tower apparatus, etc., estimated to cost \$150,000.

R. P. Johnson, Wytheville, Va., machinery dealer, has been making inquiries for a 10-hp. horizontal engine, without boiler.

The Pulaski Veneer Corporation, Pulaski, Va., recently organized with capital of \$100,000, has plans under way for a new local mill consisting of main three-story plant, 80 x 190 ft.; one-story machine building, 80 x 125 ft.; saw mill, boiler house, etc. The complete works will cost close to \$70,000. Earl B. Lange is president.

The Beaver Products Co., Inc., Beaver Road, Buffalo, manufacturer of roofing specialties, is said to have concluded negotiations for lease of a mill at Fort Wentworth, Ga., and will remodel the structure for the production of kraft papers under a new process. The work is estimated to cost about \$45,000. F. E. Davenport will be factory manager.

The Headen Motor Car Co., Albany, Ga., has secured a one-story building 52 x 200 ft., and will remodel and equip for a new automobile assembling works. The installation will include drill presses, lathes, forge equipment, bench tools, air compressor, etc. Walter Armwood, 2603 Twenty-sixth Street, Tampa, Fla., is architect.

The Board of Trustees, Rabun Gap Industrial School, Athens, Ga., plans to rebuild the portion of the main structure destroyed by fire March 18, with loss estimated at \$23,000 including equipment.

The J. Carey King Co., Inc., 37 New York Avenue, N. E., Washington, will build a one-story addition to its mill-work plant, 100 x 250 ft., for the manufacture of sash, doors, etc., to cost \$55,000 with machinery. James Berrell, Colorado Building, is architect.

The Monarch Machine & Mfg. Co., 531 South Eugene

STEEL Posts Are Placed Into Steel Sockets in the Pavement. This removable safety station was installed on Market Street, San Francisco, and cost, it is stated, one-third that of the permanent safety station, and it of course can be taken out of the way when desired.



Street, Greensboro, N. C., has acquired the local plant and equipment of the W. J. Westbrook Elevator Co. Operations will be continued at the acquired works for the manufacture of portable wood saws and kindred equipment. A general repair works also will be operated.

The Roanoke-Staunton River Power Co., Roanoke, Va., has secured a preliminary permit for a proposed hydroelectric power project on the Roanoke River, vicinity of Goose Creek, with initial installation of about 16,000 hp. A transmission system will be built. The entire project is reported to cost \$400,000.

The Craven Construction Co., Commercial National Bank Building, High Point, N. C., has inquiries out for a quantity of portable wood-working machinery, suitable for contractors. O. A. Craven is president.

The R. S. Armstrong & Brother Co., 676 Marietta Street, Atlanta, Ga., machinery dealer, has been making inquiries for a 75-hp. oil engine, Fairbanks-Morse type Y, or similar; also for a 100-hp. squirrel cake motor, 2200-volt.

The Board of Commissioners, District of Columbia, Washington, is asking bids until April 5 for one compress for scrap metal.

The Enterprise Mfg. Co., Coleridge, N. C., is considering the construction of a power house in connection with extensions in its cotton mill in the Deep River section. Lockwood, Greene & Co., Charlotte, N. C., are architects and engineers.

The Morgan Millwork Co., 113 West North Avenue, Baltimore, has awarded a general contract to the J. R. Owens Co., 1406 West Lee Street, Greensboro, N. C., for its proposed one and two-story plant at Greensboro, to cost close to \$100,000 with equipment. James M. Workman, American Bank Building, Greensboro, is architect.

The City Council, Tabor, N. C., contemplates the installation of pumping equipment in connection with a proposed municipal waterworks, to cost about \$25,000. The J. B. McCrary Engineering Corporation, Atlanta, Ga., is engineer.

The Savannah Electric & Power Co., Savannah, Ga., is said to have been acquired by the Engineers' Public Service Co., an interest of Stone & Webster, Inc., 147 Milk Street, Boston. Plans are under advisement for extensions and improvements to cost close to \$850,000.

Clarence Cosby, 1523 East Cary Street, Richmond, Va., has been making inquiries for two lift-cranes or traveling derricks, each about 2500 lb. capacity, electric or steam-operated.

The Town Council, Highlands, N. C., has applied for permission to construct and operate a municipal hydroelectric power plant on the Cullasagee River, Nantahala National Forest, Macon County, to cost \$80,000. A transmission line will be built.

The Grove Stone & Sand Co., Asheville, N. C., has inquiries out for a vertical boiler, 48-in. diameter, to operate 125 lb. working pressure.

The Pennsylvania Engineering Works, New Castle, Pa., has resumed production of iron castings, after suspension of operations for repairs and improvements. The foundry has a capacity of 1000 tons per month of gray iron and semi-steel castings, from 10 lb. to 50 tons each. The company has established a complete welding department, with facilities for all kinds of light and heavy work. R. H. Banks, 530 Union Trust Building, Pittsburgh, is in charge of sales.

Gulf States

BIRMINGHAM, March 29.

BIDS will be received by the Town Council, Sebring, Fla., until April 20, for the construction of a municipal electric light and power plant, including a 5-ton crane. The Solomon Norcross Co., Candler Building, Atlanta, Ga., is consulting engineer.

The City Council, Lisbon, Tex., is considering the installation of pumping equipment in connection with a proposed municipal waterworks, for which a bond issue of \$65,000 has been authorized.

The Charles Schutte Body Co., Lancaster, Pa., manufacturer of automobile bodies, is said to have plans under consideration for new branch works at Haines City, Fla., primarily for the production of bodies for automobile buses, reported to cost \$50,000.

The Gulf Coast Machinery & Supply, Port Arthur, Tex., has preliminary plans for a one-story foundry and machine shop, the former to be equipped for the production of brass castings. The expansion is estimated to cost \$25,000 with equipment. R. M. Tyron is general manager.

The Purvis Public Service Co., Purvis, Miss., is arranging a bond issue of \$75,000, the proceeds to be used for extensions and improvements in its steam-operated power plant, including the installation of additional equipment.

The Texas Public Service Co., Marshall, Tex., will erect a one-story ice-manufacturing plant at Mount Pleasant, Tex., to cost about \$50,000 with equipment. John Carpenter, Woolworth Building, Marshall, is architect.

The Corinth Brick Co., Corinth, Miss., will begin work on additions and improvements at its plant, to include the installation of mechanical drying equipment and other apparatus. The expansion will cost close to \$40,000.

The South Jacksonville Utilities Co., South Jacksonville, Fla., is considering plans for rebuilding its power house, recently destroyed by fire. The new station is reported to cost \$250,000 with equipment. E. L. Gunn is president.

Charles E. Currie & Co., Ashland, Ala., have inquiries out for an 8-ft. conical ball mill, Harding-type preferred.

The Greenville Mill & Elevator Co., Greenville, Tex., plans the construction of a new headhouse and other extensions, with the installation of elevating, conveying and other equipment. The project is reported to cost about \$60,000.

The Sanquilt Spinning Co., Capron, N. Y., plans the construction of a power house at its proposed yarn mill at Gadsden, Ala. A machine shop will also be installed. The entire project will cost approximately \$1,000,000.

The White Co., Cleveland, manufacturer of motor trucks, has plans for a one-story factory branch, service and repair works at Avenue C and Seventeenth Street, Birmingham, 140 x 150 ft., to cost about \$75,000. C. H. McCauley, Jackson Building, Birmingham, is architect.

The W. D. Hadden Co., Bankers' Mortgage Building, Houston, Tex., has preliminary plans for a ship repair plant on the Simms Bayou, estimated to cost \$150,000.

The Board of Education, Brownsville, Tex., plans the installation of a manual training department in its proposed three-story senior high school, to cost \$165,000, for which bids will soon be asked on a general contract. H. P. Smith,

National Bank of Commerce Building, San Antonio, Tex., is architect.

The Airkool Spark Plug Co., 252 Twenty-ninth Street, N. W., Miami, Fla., has filed plans for a two-story addition to cost about \$37,000 with equipment.

The Monroeville Ice & Power Co., Monroeville, Ala., has plans for a steam-operated electric light and power house, to cost about \$30,000.

The City Council, Isola, Miss., is asking bids until April 13 for extensions and improvements in the municipal electric light plant and waterworks, including equipment. Henry A. Mentz, Citizens' Bank Building, Hammond, La., is engineer.

M. C. Stockbridge, 1038 East College Street, Shreveport, La., and associates plan the construction of a new cottonseed oil mill at Natchez, Miss., to cost about \$45,000 with equipment. It is proposed to organize a company to carry out the project.

The Board of Commissioners, New Smyrna, Fla., is asking bids until April 12, for one 600-hp. Diesel or semi-Diesel engine, direct-connected to a 400 kw. Westinghouse generator, with complete auxiliary equipment; also, for alternate bids on a 720-hp. engine and suitable generator of capacity as noted. George J. Ott is city manager.

The Standard Brass Mfg. Co., Port Arthur, Tex., has plans for a one-story machine shop, 50 x 112 ft., to cost about \$20,000 with equipment.

The City Council, Rochester, Tex., plans the installation of pumping machinery in connection with a proposed municipal waterworks to cost \$40,000. A bond issue in this amount is being arranged.

The Texas Central Power Co., San Antonio, Tex., plans extensions and improvements in its ice-manufacturing plant at Alice, Tex., to cost about \$25,000 with equipment.

The Board of Port Commissioners, Court House, New Orleans, is asking bids until April 20 for eight ball-bearing electric motors, from 15 to 40 hp. each.

J. W. Cain & Co., Second National Bank Building, Houston, Tex., are in the market for 10 used contractors' dump cars.

Milwaukee

MILWAUKEE, March 29.

WITH few exceptions, the automotive industries appear to have filled the bulk of requirements of new machine tools, orders from this source consisting mainly of single tools for specific purposes or special designs. Business, on the whole, is moderately active and enough orders are being booked to insure a continuance of the present satisfactory rate of operations of tool builders for an indefinite period. Dealers as a rule report a fair demand, garages and repair shops being probably the best buyers, both of new and used equipment.

The Hamilton Mfg. Co., Two Rivers, Wis., manufacturer of metal and wood printing house furniture, fixtures, materials, etc., dental office furniture, and similar goods, has engaged Lockwood, Greene & Co., 400 North Michigan Avenue, Chicago, to design plant additions which will increase the total area to 600,000 sq. ft., and require a large list of miscellaneous equipment. A new issue of \$1,000,000 first mortgage gold bonds has been made to cover the project. Contracts for the construction work will be placed during April. George S. Hamilton is president.

The Carryola Co. of America, 653 Clinton Street, Milwaukee, manufacturer of portable phonographs exclusively, has acquired the former plant of the Evinrude Motor Co. at 279 Walker Street, thus adding 45,000 sq. ft. to its manufacturing area. The main plant on Clinton Street recently was enlarged 15,000 sq. ft., to 50,000 sq. ft. The Walker Street plant will require thorough retooling, having been occupied by the Western Worsted Mills since it was vacated by the Evinrude company for its present plant at Twenty-seventh and Florence Streets several years ago. Orton L. Prime is president, and Don T. Allen, vice-president and general manager of the Carryola company.

The Milwaukee branch, Packard Motor Car Co. of Chicago, 3501-3511 Grand Avenue, Milwaukee, let the general contract to Paul Riesen's Sons, 1042 Humboldt Avenue, local, for a brick, steel and concrete service floor addition, 70 x 200 ft., one story and part basement, costing about \$65,000 with equipment. The architects are Brust & Philipp, 405 Broadway, Milwaukee. N. P. Hansen is branch manager.

The Loeffelholz Co., 170 Clinton Street, Milwaukee, brass founder, has plans for the complete reconstruction and modernizing of its plant at a cost of \$200,000. The first unit, to be erected immediately, will be 50 x 140 ft., 30 ft. high, and cost \$75,000 complete. A second unit will be un-

dertaken upon its completion, to avoid interruption of production. The architect is H. C. Haeuser, 445 Milwaukee Street. George B. Miller is works manager.

The Fulton Co., 732 Seventy-fifth Avenue, West Allis, Milwaukee, manufacturer of automobile accessories and equipment, metal stampings, etc., has let the general contract to the Pfeiffer Construction Co., 586 Sixty-sixth Avenue, for the erection of a manufacturing addition to cost \$35,000. Equipment is now being purchased.

The Milwaukee Brass Specialty Co., 3200 Senator Avenue, Milwaukee, has awarded contracts for the erection of a new manufacturing building, 50 x 40 x 100 ft., at 1321 Thirtieth Street, costing about \$40,000 complete. The engineers are Byrne Brothers, 3112 Burleigh Street, Milwaukee.

The Voell Auto Sales Co., Fond du Lac, Wis., has plans by A. W. Hoffmann, architect, 86 Michigan Street, Milwaukee, for a public garage, sales and service building, 150 x 200 ft., part two stories and basement. The machine shop and service floor will occupy a space of 50 x 100 ft.

Detroit

DETROIT, March 29.

PRELIMINARY plans are being prepared by the Federal Mfg. Co., East Eighth Street, Holland, Mich., manufacturer of metal stampings, etc., for a one-story addition, 80 x 175 ft., to cost approximately \$40,000. Thomas Clinger is president and treasurer.

The Consumers Power Co., Jackson, Mich., is said to be arranging an appropriation of about \$2,000,000 for extensions and improvements in its local power plant and system during the present year.

The American Glass Co., 1423 Holden Street, Detroit, has plans for a two-story addition, 37 x 100 ft., to cost approximately \$30,000. R. C. Sheehan is general manager.

The Shaw-Walker Co., 27 Division Street, Muskegon, Mich., manufacturer of sectional bookcases, filing cabinets, etc., has asked bids on a general contract for a five-story and basement addition, 80 x 200 ft., to cost about \$250,000 with equipment. Albert Kahn, Marquette Building, Detroit, is architect and engineer.

The Lake Independence Lumber Co., Big Bay, Mich., plans to begin work early in May on rebuilding its lumber mill lately destroyed by fire. The new plant is estimated to cost \$400,000 with machinery. J. B. Deutsch is president.

The City Council, Muskegon, Mich., is said to be planning for the early purchase of pumping machinery with a capacity of 10,000,000 gal. per day, for the municipal waterworks.

The Oakland Stamping Machine Co., Rochester, Mich., is said to be considering a one and two-story addition. Actual construction will be delayed for several months. E. L. Stryker is president.

Donald M. Teer and J. S. Wickwire, Jackson, Mich., have organized Teer-Wickwire & Co., who have acquired the local works of the Butcher & Gage Machine Co., and contemplate extensions and betterments, with additional equipment.

The American Car & Foundry Motors Co., a subsidiary of the American Car & Foundry Co., 165 Broadway, New York, recently organized to take over and consolidate the Fageol Motors Co., Kent, Ohio, and the Hall-Scott Motor Co., Berkeley, Cal., will establish its main plant for the manufacture of motor buses and coaches at Detroit, where 45 acres has been selected. It is planned to develop an output of about 15 complete buses per day. W. H. Woodin, president of the parent company, is chairman of the board; Col. E. J. Hall is vice-president of engineering, in charge of operations.

The Piston Ring Co., 500 Sanford Street, Muskegon, Mich., expects to ask bids early in April for its proposed four-story and basement addition, 120 x 125 ft., to cost about \$100,000. C. E. Johnson is president.

The Christopher Smith & Sons Boat Co., Algonac, Mich., is completing the construction of a one-story addition to provide for a total plant space of 30,000 sq. ft.

The Oakland Motor Car Co., Pontiac, Mich., has acquired considerable equipment of the Ternstedt Mfg. Co., Detroit, manufacturer of automobile hardware, and will remove to its new plant unit at Pontiac, to be given over to the manufacture of axles, as well as sheet metal products. The new unit will give employment to about 250 operatives. The purchased equipment is said to represent an investment of \$500,000.

The Board of Education, Belleville, Mich., plans the installation of manual training equipment in its proposed two-story high school to cost \$200,000, for which plans are being drawn by Verner, Wilhelm & Molby, Book Building, Detroit, architects.

The Dynamic Radio Corporation, Detroit, was recently

incorporated with capital stock of \$10,000 and has engaged in the manufacture of power units for radio receivers. Offices and factory are temporarily located at 3016 Montclair Avenue. Frank C. Painter, formerly sales manager of the radio division of the Dongan Electric Mfg. Co., is secretary and treasurer.

The Kalamazoo Re-Tinning Co., Inc., 1331 Portage Street, Kalamazoo, Mich., has been incorporated with capital of \$5,000, and has engaged in the re-tinning of milk and ice cream cans. L. D. Sherwood is president and general manager.

Pacific Coast

SAN FRANCISCO, March 24.

PLANs have been completed by the Union Oil Co., Los Angeles, for a new storage and distributing works at Wilmington Street and San Pedro Road, San Pedro, to cost about \$150,000, with equipment.

The Los Angeles Gas & Electric Co., 810 South Flower Street, Los Angeles, has plans nearing completion for a two-story automatic power substation, 50 x 120 ft., to cost \$50,000 with equipment.

The Glenn-Colusa Irrigation District, Willows, Cal., William Durbrow, manager, has tentative plans for a hydroelectric power plant on the Sacramento River, near Hamilton City, Glenn County, with initial capacity of 13,000 hp., to cost \$2,000,000 with power dam and transmission system.

The American Can Co., 120 Broadway, New York, is arranging for a two-story addition to its plant at 4815 Santa Fe Avenue, Vernon, Los Angeles, 155 x 650 ft., to cost close to \$350,000 with equipment. The company engineering department is in charge.

The Cold Storage & Warehouse Co., Inc., Boise, Idaho, has plans under way for a new cold storage plant at Nampa, Idaho, to cost about \$55,000.

The City Council, Pocatello, Idaho, plans the installation of pumping machinery and other mechanical equipment in connection with extensions and improvements in the municipal waterworks, estimated to cost \$463,000, in which amount a bond issue is being arranged. The Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., and Marsh-Strong Building, Los Angeles, is engineer.

The Tennent Steel Casting Co., Tacoma, Wash., is considering the construction of a new one-story foundry to cost about \$80,000 with equipment.

The Zonolite Co., Spokane, Wash., James Keith, president, is considering the construction of a new plant at Libby, Mont., to cost \$75,000. The installation will include a revolving dryer, Dutch ovens, elevating machinery, etc. Edward Alley, Libby, is general manager.

The Priest Rapids Ice & Cold Storage Co., White Bluffs, Wash., will erect a four-story cold storage and refrigerating plant, 80 x 112 ft., to cost about \$100,000 with equipment. John W. Maloney, Yakima, Wash., is architect.

The Pacific Casket Co., 715 South Johnston Street, Los Angeles, is having plans completed for a one-story addition, 30 x 155 ft., to cost \$20,000. Leon C. Brockway, Security Building, Pasadena, Cal., is architect.

The Ojai Irrigation District, Ojai, Cal., is considering the construction of a hydroelectric power plant on the Santa Clara River, Ventura County, to cost in excess of \$1,000,000 with power dam and transmission system.

The General Petroleum Co., Tacoma, Wash., has filed plans for the first unit of a new storage and distributing plant on the tide flats, estimated to cost \$65,000. Other units will be built later.

The Olympic Portland Cement Co., Marietta Road, Bellingham, Wash., is considering the construction of a crushing mill addition, with initial daily capacity of 1000 tons, to cost approximately \$55,000 with machinery.

The Acme Gravel Co., Potrero Avenue and Army Street, San Francisco, is having plans drawn for new sand and gravel plants at Oakland and Berkeley, Cal., each to be one-story, with conveying, handling, loading and other equipment. The entire project will cost \$150,000. A. R. McLaren, 693 Mission Street, is engineer.

M. G. Tennent, recently elected mayor of Tacoma, Wash., will build a foundry to cost about \$5,000.

The Pacific Car & Foundry Co., Seattle, has received an order from the Bloedel-Donovan Co., for 12 logging cars.

The Sampson Machine Co., Seattle, has been organized with a capital of \$30,000. Offices are in room 1120, L. C. Smith Building.

The Seattle office of the Austin Co. has secured a contract for the erection of a one-story mill construction building for A. H. Cox & Co., Inc., on First Avenue and Holgate Street. A 5-ton crane will be installed.

The Northwest Fence & Wire Works, Portland, Ore., has

increased its capital from \$50,000 to \$100,000 and will make extensions.

A three-story garage, 120 x 120 ft., will be built by the Sorento Garage Co., at 4557 Eleventh Avenue, Seattle. O. B. Dean is in charge of construction.

The U. S. Machine Co., 750 Folsom Street, San Francisco, is inquiring for single head bolt threading machines, 1½ and 2-in. capacity.

Cleveland

CLEVELAND, March 29.

BUSINESS with local machine tool dealers was quiet the past week, with few orders for more than one machine. While buying in this territory is light, some machine tool manufacturers are making a fair volume of sales. An order for 12 brass working turret lathes was placed during the week with a local manufacturer by a maker of plumbers' brass goods in the Chicago territory. Export orders for seven turret lathes from England and France were received by the same manufacturer. There is a fair amount of activity in automatic screw machines in small lots, some of this business coming from the railroads. The Nickel Plate Railroad will require equipment to replace that destroyed in its Frankfort, Ind., shops, recently burned, but has not yet issued a list. The demand for machine tools from the automotive industry continues light. The Wellman-Seaver-Morgan Co., Cleveland, has purchased a 48-in. planing machine. The Ford Motor Co., Detroit, has bought two 2-spindle drum type milling machines and two spline milling machines.

A. Schrader's Sons, Inc., of Ohio, manufacturer of tire valves, will erect an assembling plant in Akron, at an estimated cost of \$300,000. Contract for the plant, which will be five stories, 52 x 200 ft., has been placed with the Turner Construction Co., Buffalo.

The Humphreys Mfg. Co., Mansfield, Ohio, manufacturer of power and hand pumps, has placed contract with Jacob Wolf & Sons, Mansfield, for a two-story factory, 53 x 133 ft. W. C. Moore is president.

The Case School of Applied Science, Cleveland, has completed plans for a mechanical engineering building and boiler house at an estimated expenditure of \$350,000. It will be two and three stories, with basement, 180 x 240 ft., and will include machine and pattern shops, foundry, research and drafting rooms and laboratories. Foundry equipment, several 2-ton hand operated cranes and two 320-hp. water tube boilers will be required. Wilbur Watson & Associates, 4614 Prospect Avenue, are the engineers.

The Draper Mfg. Co., East Ninety-first Street and Train Avenue, Cleveland, contemplates the erection of an extension to cost approximately \$60,000. C. T. Draper is president and general manager.

The Western Reserve Foundry Co., 1209 Marquette Street, Cleveland, contemplates the erection of a new foundry, but the project may not mature for some time. F. T. Chyall is president.

The Upson-Walton Co., 1310 West Eleventh Street, Cleveland, ship chandler, has awarded contract for a one-story machine shop, 120 x 120 ft., and a forge shop, 60 x 120 ft. These will replace present buildings and no new equipment will be required.

The Empire Phono Parts Co., 2261 East Fourteenth Street, Cleveland, will occupy a new plant to be built by T. P. Carey, 10500 Lake Avenue, at Madison Avenue, near West 104th Street. It will be two stories and basement, 66 x 110 ft. The Empire Phono Parts Co. expects to purchase a small amount of equipment. W. J. McNamara, is president.

St. Louis

ST. LOUIS, March 29.

PLANs are being considered by the United States Gypsum Co., 205 West Monroe Street, Chicago, manufacturer of wallboard and kindred products, for the construction of a new mill near Kansas City, Mo., reported to cost \$500,000 with equipment. The proposed works will include a power house and machine shop.

Bids will soon be asked by the Board of Trustees, St. Mary's Hospital, Twenty-ninth and Main Streets, Kansas City, Mo., for a new power plant to cost \$90,000. The Burns & McDonnell Engineering Co., Interstate Building, is engineer.

The National Tank Co., Tulsa, Okla., J. P. Walker, president, recently organized, has acquired the plant and business of the Oklahoma Tank Co., Cushing, Okla. The company has also purchased a site at Tulsa and contemplates erection of a one-story plant, 200 x 300 ft., for the manufacture of welded and riveted steel tanks.

The Oklahoma Gas & Electric Co., Oklahoma City, Okla., is disposing of a bond issue of \$4,000,000, the proceeds to be used for the acquisition of utility properties at Wilson and Ardmore City, Okla., and for extensions and improvements in power plants and system. Preliminary plans are under way for an addition to the present steam-operated power house, known as the Horse Shoe Lake plant, near Oklahoma City. John J. O'Brien is president.

The Angell Disk Plow Co., 1311 Seventh Avenue, Dodge City, Kan., George Fowler, president, is considering preliminary plans for a new one-story factory, to cost \$25,000 with equipment.

The Brogan Motor Co., Claremore, Okla., has arranged for the construction of a one-story service, repair and garage building, 45 x 130 ft., to cost \$65,000 with equipment.

The Ben Sibbitt Iron & Foundry Co., 617 Moore Street, Wichita, Kan., has plans for a one-story foundry addition, 35 x 80 ft., for which superstructure will begin at once.

The St. Louis Cooperage Co., 133 Arsenal Street, St. Louis, has awarded a general contract to the Widmer Engineering Co., Laclede Gas Building, for a new two-story plant, 100 x 200 ft., to cost approximately \$50,000 with equipment.

The Pioneer Lead & Zinc Co., Miami, Okla., is said to be arranging to rebuild its milling plant recently destroyed by fire, with loss estimated at \$80,000 including equipment.

The Board of Education, Lexington, Mo., plans the installation of manual training equipment in its proposed two-story high school to cost \$200,000, for which bids will be asked early in April. J. H. Felt & Co., Balcony Building, Kansas City, Mo., are architects.

The Chicago, Burlington & Quincy Railroad Co., Chicago, is reported to have plans under advisement for a new engine house, with repair facilities, at Burwell, Neb., to cost about \$50,000.

The Progressive Brass Mfg. Co., 1711 Cherry Street, Kansas City, Mo., has acquired property on Holmes Street and will erect an addition to cost \$40,000.

The City Council, Picher, Okla., plans the installation of an air compressor, pumping apparatus and auxiliary equipment at the municipal waterworks.

The George Cutter Co., South Bend, Ind., a subsidiary of the Westinghouse Electric & Mfg. Co., East Pittsburgh, has begun the construction of a new one-story plant, 85 x 475 ft., on site recently acquired at St. Louis, for the manufacture of concrete lighting standards. B. H. Prack, 119 Federal Street, Pittsburgh, is engineer.

The General Metal Products Co., St. Louis, formerly the Von der Au & Cluss Mfg. Co., has leased 35,000 sq. ft. of space in the Anheuser-Busch plant and will move from 2400-2408 South Jefferson Avenue. The company was organized in 1889, and is capitalized at \$75,000. Herman von der Au is president and R. A. Kaltwasser, secretary and general manager.

Canada

TORONTO, March 29.

LOCAL dealers and builders state that increased activity in railroad car building and automotive shops has stimulated business in machine tools, and while sales generally have been greater, inquiries are also more numerous. Most makers of machine tools report a good demand, with orders of a diversified type which cover many lines of industrial activity.

The Canadian Pacific Railway, with head office at Montreal, will purchase the following equipment: For the Aroostook, N. B., shops, two 50-ton high speed self-lowering jacks for Bowmanville Junction, Me., an Acme bolt threading machine; for McAdam, N. B., two 75-ton high speed jacks and two No. 19 lowering jacks, also an electric welding generator.

G. W. Slater, engineer, is preparing plans for new digester for the St. Maurice Valley Corporation, Cap de la Madeleine, Que., to cost \$50,000.

The Caloric Furnace Co., has secured quarters in a foundry at Alliston, Ont., and will remove its business from London, Ont., to the new location. W. J. Shibley is manager.

The buildings at Yarmouth, N. S., owned and occupied for many years by the New Burrill-Johnson Iron Co., have been taken over by the Cedar Lake Lumber Co., which will

install equipment for the manufacture of hardwood products.

The West Coast Boiler & Tank Co., a subsidiary of the Seattle Works, has completed arrangements for the occupancy of one of the buildings of the Heaps Engineering Co., New Westminster, B. C., and will install equipment for the manufacture of tanks. Frank Hopkins, Seattle, Wash., is manager of the company.

Foreign

THE Government of the Argentine Republic, Buenos Aires, has authorized an appropriation of \$73,500 for the construction of a hydroelectric generating station at Andalgalá, Province of Catamarca. The output will be used for mining and smelting operations, as well as other industrial work in this district. Information at the office of the Bureau of Foreign and Domestic Commerce, Washington, reference Argentina 35X; also, at the American Consulate, Buenos Aires, Edward Feely, commercial attaché.

In connection with its proposed operations in Russia, the International Oxygen Co., 796 Frelinghuysen Avenue, Newark, N. J., manufacturer of acetylene welding apparatus, etc., will proceed with the construction of 11 plants in different parts of that country, including instruction departments for operators and others. A. A. Heller, treasurer and general manager, has recently returned from a trip to Russia to perfect plans, including the organization of a subsidiary company with capital of \$500,000 to operate in that country.

The British Empire Chamber of Commerce in the United States, 25 Broadway, New York, has received an inquiry (728) from a British concern desiring to get in touch with American manufacturers of high tension batteries; also an inquiry (734) from a British company wishing to get in contact with American manufacturers of nickel wool.

The municipal officials, Dublin, Ireland, are completing plans for extensions and improvements in the local water supply system at a cost of about \$600,000; to include the installation of mechanical filters, pumping machinery and other equipment. Information at the office of the Bureau of Foreign and Domestic Commerce, Washington, reference No. 200117; also, at the American Consulate, Dublin, H. M. Collins, consul.

The Provincial Engineering Co., engineer and machinery merchant, Lashore, India, desires to make arrangements with an American company to act as its representative in the United States for the purchase of machinery. It is also desirous of getting in touch with companies specializing in the export of oil expellers.

Trade Changes

The Metal Mold Castings Co., Inc., a new corporation, has purchased all of the assets and assumed all of the liabilities of the Bronzo Alumina Corporation, 212-218 Winchester Avenue, Buffalo, by stock transfer. There is no change in management except that Theodore H. Pickering, formerly with Josiah Anstice & Co., Rochester, N. Y., has joined the organization as president. J. Ernest Kaufmann is vice-president and Eames Donaldson is secretary and treasurer. Capitalization of the Metal Mold Castings Co., Inc., is 1000 shares of \$100 par value preferred stock and 10,000 shares of no par common. Approximately \$40,000 of this preferred stock has been subscribed to, largely by Buffalo capital. The change takes effect April 1. The capacity of the plant is 5000 lb. of aluminum castings per day and about 50 men are employed.

The New York Wire Works, Inc., manufacturer of machine guards, office railings, etc., is moving from its plant at 175 Morris Avenue, Newark, N. J., to larger quarters at 107-109 Hunterdon Street. Harry Isakoff is president.

The Sharpsville Furnace Co., Oliver Building, Pittsburgh, announces that by mutual agreement the contract for the sale of its iron with Rogers, Brown & Crocker Brothers, Inc., has been canceled, effective March 1, last. The iron the company will have, over and above requirements of its regular customers, will be handled by its own sales organization, in charge of William H. Price, sales manager.

The Mechanical Pattern Works, Inc., has moved to 4545 Pacific Avenue, Los Angeles, and has changed its name to Mechanical Pattern & Foundry Co., Inc.

The L. D. Fisher Co., Milwaukee, broker in ferrous and non-ferrous used metals, opened a Chicago office on March 15, at 28 South Dearborn Street. Mark J. Kelly, formerly connected with the scrap iron department of the Chicago office of Hickman, Williams & Co., is in charge.

Strong-Stott Mfg. Co., Minneapolis, has appointed George W. Heald as its representative at 53 West Jackson Boulevard, Chicago. This company manufactures the Unipulvo system of powdered coal combustion equipment for boilers and furnaces.

Current Metal Prices

On Small Lots, Delivered from Stocks, New York

THESE prices are given for the convenience of small-lot buyers whose requirements do not run into mill-size orders.

Only base prices can be listed in some cases, due to limits of space; other items of a given group are deducible from the base price.

The prices which are quoted below are those at which small lots may be bought, whether from jobbers' or other stocks.

Complete market reports and prices on large shipments from mills will be found elsewhere under "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates		Per Lb.
Bars:		
Refined iron bars, base price.....	3.24c.	
Swedish charcoal iron bars, base.....	7.00c. to 7.25c.	
Soft steel bars, base price.....	3.14c. to 3.24c.	
Hoops, base price.....	4.49c.	
Bands, base price.....	3.99c.	
Beams and channels, angles and tees, 3 in. x ¼ in. and larger base.....	3.24c. to 3.34c.	
Channels, angles and tees under 3 in. x ¼ in. base.....	3.14c. to 3.24c.	
Steel plates, ¼ in. and heavier.....	3.24c. to 3.34c.	
Merchant Steel		Per Lb.
Tire, 1½ x ½ in. and larger.....	3.30c.	
(Smooth finish, 1 to 2½ x ¼ in. and larger).....	3.65c.	
Toe-calk, ½ x ¾ in. and larger.....	4.20c.	
Cold-rolled strip, soft and quarter hard.....	6.25c.	
Open-hearth spring steel.....	4.50c. to 7.00c.	
Shafting and Screw Stock:		
Rounds and hex.....	4.00c. to 5.00c.	
Square and flats.....	4.50c. to 5.50c.	
Standard tool steel, base price.....	12.00c.	
Extra tool steel.....	15.00c. to 18.00c.	
Special tool steel.....	20.00c. to 23.00c.	
High-speed steel, 18 per cent tungsten.....	70c.	
Sheets		Per Lb.
Blue Annealed		
No. 10.....	3.89c.	
No. 12.....	3.94c.	
No. 14.....	3.99c.	
No. 16.....	4.09c.	
Box Annealed—Black		Per Lb.
Soft Steel C. R. One Pass		
Nos. 18 to 20.....	4.30c.	5.75c.
Nos. 22 and 24.....	4.35c.	5.90c.
No. 26.....	4.40c.	6.05c.
No. 28*.....	4.50c.	6.35c.
No. 30.....	4.70c.	6.85c.
Galvanized		Per Lb.
No. 14.....	4.75c.	
No. 16.....	4.90c.	
Nos. 18 and 20.....	5.05c.	
Nos. 22 and 24.....	5.20c.	
No. 26.....	5.35c.	
No. 28*.....	5.65c.	
No. 30.....	6.15c.	
*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.		
Welded Pipe		
Standard Steel		
Black Galv.		
½ in. Butt.....	46 29	
¾ in. Butt.....	51 37	
1-3 in. Butt.....	53 39	
2½-6 in. Lap.....	48 35	
7 & 8 in. Lap.....	44 17	
11 & 12 in. Lap.....	37 12	
Wrought Iron		
Black Galv.		
½ in. Butt.....	4 +19	
¾ in. Butt.....	11 + 9	
1-1½ in. Butt.....	14 + 6	
2-in. Lap.....	5 +14	
3-6 in. Lap.....	11 + 6	
7-12 in. Lap.....	3 +16	
Bolts and Screws		
Machine bolts, cut thread, 40 and 10 per cent off list		
Carriage bolts, cut thread, 30 and 10 per cent off list		
Coach screws, 40 and 10 per cent off list		
Wood screws, flat head iron,		
77½, 20, 10, 10 and 10 per cent off list		
Steel Wire		Per Lb.
BASE PRICE† ON NO. 9 GAGE AND COARSER		
Bright, basic.....	4.25c.	
Annealed, soft.....	4.50c.	
Galvanized, annealed.....	5.15c.	
Coppered, basic.....	5.15c.	
Tinned, soft Bessemer.....	6.15c.	

†Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire		BASE PRICE
High brass sheet.....	18½c. to 19½c.	
High brass wire.....	19½c. to 20½c.	
Brass rods.....	16½c. to 17½c.	
Brass tube, brazed.....	26½c. to 27½c.	
Brass tube, seamless.....	23½c. to 24½c.	
Copper tube, seamless.....	24¼c. to 25¼c.	
Copper Sheets		
Sheet copper, hot rolled, 22½c. to 23½c. per lb. base.		
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.		
Tin Plates		
Bright Tin	Grade "AAA" Grade "A"	Coke—14x20 Prime Seconds
	Charcoal 14x20 Charcoal 14x20	
IC..	\$11.25 \$8.85	80 lb.. \$6.15 \$5.90
IX..	12.85 10.85	90 lb.. 6.30 6.05
IXX..	14.40 12.55	100 lb.. 6.45 6.20
IXXX..	15.75 13.85	IC.. 6.65 6.40
IXXXX..	17.00 15.05	IX.. 7.85 7.60
		IXX.. 9.00 8.75
		IXXX.. 10.35 10.10
		IXXXX.. 11.35 11.10
Terne Plates		
14 x 20		
IC—8-lb. coating.....	\$7.75 to \$8.00	
IC—20-lb. coating.....	10.00 to 11.00	
IC—30-lb. coating.....	12.00 to 13.00	
IC—40-lb. coating.....	13.75 to 14.25	
Fire-door stock.....	10.50	
Tin		
Straits, pig.....	65½c. to 66c.	
Bar.....	68¼c. to 69c.	
Copper		
Lake ingot.....	15¼c.	
Electrolytic.....	15 c.	
Casting.....	14¼c.	
Spelter and Sheet Zinc		
Western spelter.....	8¼c. to 9¼c.	
Sheet zinc, No. 9, base, casks.....	13¼c.; open, 13¼c.	
Lead and Solder*		
American pig lead.....	9 c. to 10 c.	
Bar lead.....	11¼c. to 12¼c.	
Solder, ½ and ½ guaranteed.....	40¼c.	
No. 1 solder.....	39¼c.	
Refined solder.....	33½c.	
*Prices of solder indicated by private brand vary according to composition.		
Babbitt Metal		
Best grade, per lb.....	68c. to 72c.	
Commercial grade, per lb.....	30c. to 35c.	
Antimony		
Asiatic.....	22½c. to 23c.	
Aluminum		
No. 1 aluminum (guaranteed over 99 per cent pure), ingots for remelting, per lb.....	30c. to 30½c.	
Old Metals		
Values follow the new metal market. Business is quiet. Dealers' buying prices are as follows:		
		Cents Per Lb.
Copper, heavy crucible.....	11.75	
Copper, heavy wire.....	11.50	
Copper, light bottoms.....	9.50	
Brass, heavy.....	7.00	
Brass, light.....	6.25	
Heavy machine composition.....	8.75	
No. 1 yellow brass turnings.....	8.25	
No. 1 red brass or composition turnings.....	8.00	
Lead, heavy.....	6.75	
Lead, tea.....	5.25	
Zinc.....	4.25	
Cast aluminum.....	18.00	
Sheet aluminum.....	18.00	